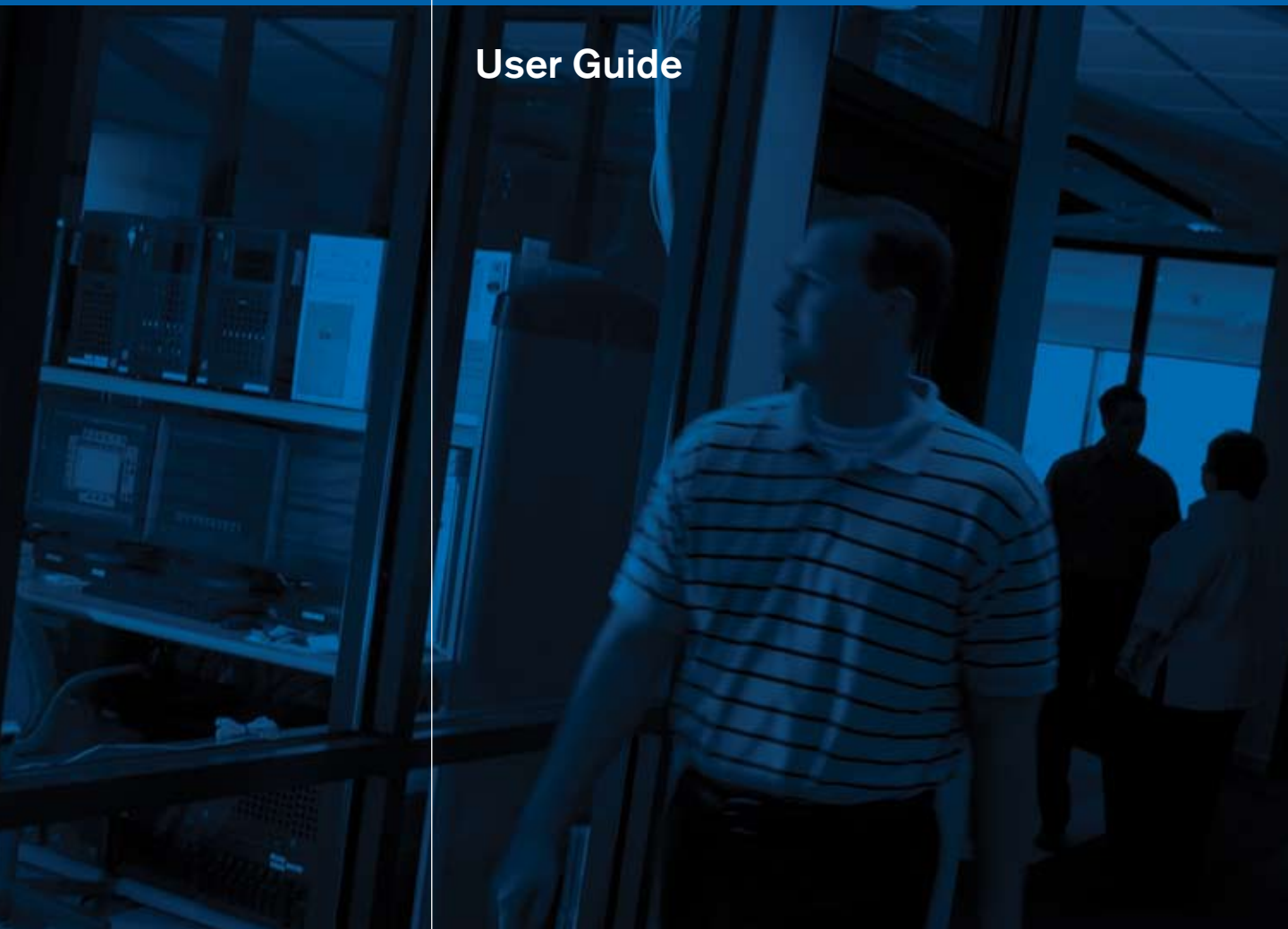
Avocent®

MergePoint™ 5224/5240

User Guide



USA Notification

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canadian Notification

This class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Safety and EMC Approvals and Markings

FCC Class A; EN55022 Class A/CISPR 22 Class A; EN55024/CISPR 24 (EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN 61000-4-6, EN 61000-4-11); EN60950/IEC60950-Compliant; CSA Listed (USA and Canada); CE Marking (Europe)

MergePoint™ 5224/5240 Service Processor Manager

User Guide

Instructions

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Dangerous Voltage

This symbol is intended to alert the user to the presence of uninsulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

Power On

This symbol indicates the principal on/off switch is in the on position.

Power Off

This symbol indicates the principal on/off switch is in the off position.

Protective Grounding Terminal

This symbol indicates a terminal which must be connected to earth ground prior to making any other connections to the equipment.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1

Introduction

All users and administrators need the introductory information in the sections listed below for understanding how to use the MergePoint service processor (SP) manager:

Supported Target Devices

A target device managed by the MergePoint 5224/5240 SP manager can be one of the following:

- An SP on a server. SPs are out-of-band management controllers that many vendors include in their servers.
- A server or other type of device that does not have an SP but that provides access to its command line through a dedicated Ethernet port. This type of device includes servers that redirect their serial console output to dedicated Ethernet ports (which provide a type of access generally referred to as serial over LAN or SoL).
- A device with a dedicated Ethernet port that supports management access via Telnet, SSH, SNMP or by means of the MergePoint 5224/5240 SP manager's native IP access capability.

NOTE: The terms target device and connected device are used in this guide when referring to an SP, server or other connected device, unless otherwise stated.

MergePoint 5224/5240 SP Manager's Advantages for Target Device Management

The MergePoint 5224/5240 SP manager, also called the appliance, controls access to server-management services that are provided by direct connected SPs and to other types of services that may be provided by other connected devices without SPs. Connected and configured devices are referred to as target devices.

A MergePoint 5224/5240 SP manager may be managed and target devices may be accessed through DSView 3 management software, as described in the document Managing MergePoint 5224/5240 Service Processor Managers Using DSView 3 Management Software. Alternately, a standalone MergePoint 5224/5240 SP manager may be managed and its target devices may be accessed using the Web Manager or console connections.

When managed as a standalone, the MergePoint 5224/5240 SP manager provides a single source for authentication, authorization-checking and management for multiple types of SPs. When managed using DSView 3 management software, the DSView 3 software acts as the single source.

Whichever way users access the MergePoint 5224/5240 SP manager, users can manage multiple servers with SPs from a single point without having to learn how to use multiple SP-management interfaces. For example, power management is provided by most SPs but each SP has its own interface and its own commands for power management. The MergePoint 5224/5240 SP manager allows an authorized user to manage power on multiple servers with SPs from multiple vendors using a single interface and a single set of power commands.

The security features provided by the MergePoint 5224/5240 SP manager work together to create a secure path between a user and a managed server or target device.

Figure 1.1 is a conceptual illustration of a secure path between a remote user and an SP through the MergePoint 5224/5240 SP manager. A remote user is shown, but users may also be locally located, on the same LAN. In Figure 1.1, the remote user accesses the MergePoint 5224/5240 SP manager through a network connection to the public Ethernet port. Users may also dial into the MergePoint 5224/5240 SP manager through an optional external modem or PC modem card.

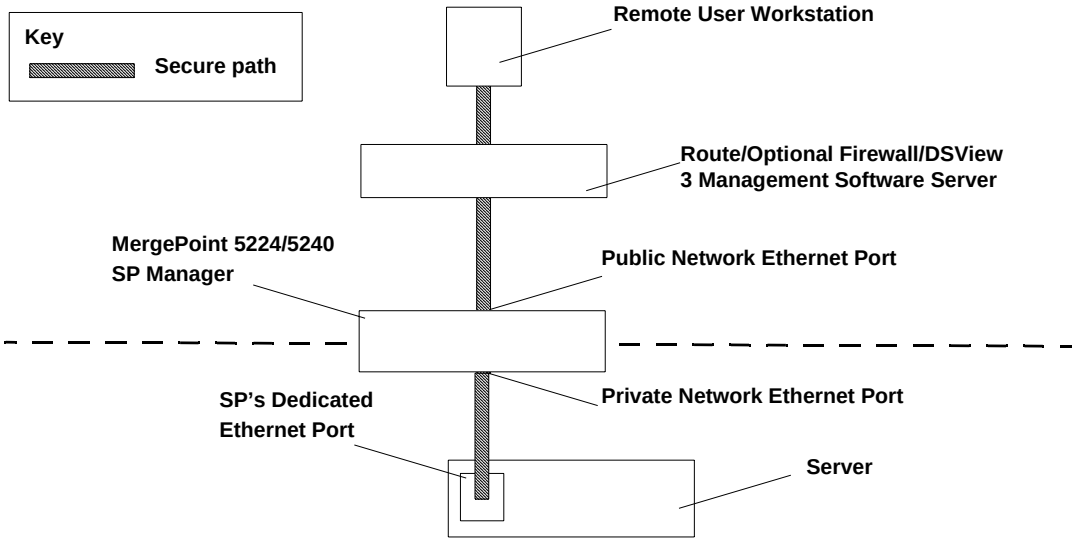


Figure 1.1: Secure Path to a Connected SP

In Figure 1.1, the dedicated Ethernet port of an SP is separate from the server's Ethernet ports. The SP's dedicated Ethernet port is connected to one of the SP manager's private Ethernet ports.

The IP address of the public Ethernet port is the only publicly defined IP address used for out-of-band management of all connected SPs, which reduces the deployment costs for the SPs.

Each target device is configured with a private designated IP address and, at the administrator's discretion, each target device may also have a virtual IP address. If virtual addresses are defined, users may be allowed to see a target device's virtual IP address but not to see the target device's privately defined IP address.

After the user selects the desired management action, the MergePoint 5224/5240 SP manager then creates a secure connection between the user and the SP, acting as a proxy on behalf of the user. While the user is performing any SP management action, the connection between the MergePoint 5224/5240 SP manager and the SP is kept separate and protected from the connection between the user and the MergePoint 5224/5240 SP manager. Nothing that happens on the private network is exposed to the public network. Depending on the mode of access (either by browser or by SSH), either HTTPS or SSH is always being used to protect communications that are transported on the public network between the user and the MergePoint 5224/5240 SP manager.

Web Manager

The Web Manager may be used when the MergePoint 5224/5240 SP manager is managed as a standalone. If the MergePoint 5224/5240 SP manager is managed through DSView 3 management software, access to the Web Manager is usually disabled.

When the Web Manager is enabled, both authorized and administrative users can launch the Web Manager from a supported browser using HTTP or HTTPS. Authorized users can use the Web Manager to perform management actions on target devices, manage power on devices plugged into optional Intelligent Power Distribution Units (IPDUs) and change their own passwords. Only administrative users have access to the MergePoint 5224/5240 SP manager screens used for configuring users or target devices.

See Chapter 3 for information about using the Web Manager that is required for authorized and administrative users.

Browser access to the Web Manager is achieved in one of the following ways:

- Through the Ethernet port
- Through dialing into one of the modem or PC phone card types described in *Dial-in Access* on page 19

Types of Users

Two predefined administrators are root and admin, and they cannot be deleted. Either root or admin can add regular user accounts and can authorize users to access management features on target devices. Any regular users added to the admin group become administrative users able to perform MergePoint 5224/5240 SP manager administration as described in the MergePoint 5224/5240 Service Processor Manager Installer and Administrator Guide. The default password for root and admin is cyclades and should be changed immediately to prevent unauthorized access.

The admin user (and any optionally added administrative users) can do the following:

- Access the Web Manager and use any of its functions
- Access the MergePoint 5224/5240 SP manager's console and use the unrestricted shell
- Invoke the MergePoint 5224/5240 SP manager configuration utility, cli
- Invoke any Linux commands available to the non-root user
- Invoke any Linux commands available to the root user by using the sudo command

The root user can do the following:

- Access the MergePoint 5224/5240 SP manager's console and use the unrestricted shell
- Invoke the MergePoint 5224/5240 SP manager configuration utility, cli
- Invoke any Linux commands available to the root user

The root user cannot access the Web Manager.

Only one administrative user can be connected to the MergePoint 5224/5240 SP manager at a time.

Regular users may be authorized for access to management features available on the connected SPs or other types of target devices.

NOTE: The administrator may create and enable a custom security profile that has the override authorization feature set, which causes all authenticated users to have all access to all target devices. For details, see *Security Profiles' Effects on Users' Actions* on page 14.

Table 1.1 shows which management options are available on the supported SP types and on supported devices without SPs.

Table 1.1: Supported Target Device Types and Management Options

Supported Service Processors/ Devices	SP Console	Target Device Console/ SoL	Power	Event Logs	Sensors	NativeIP and DirectCommand
ALOM	Y	Y	Y	Y	Y	N
Device	N	Y	N	N	N	Y
DRAC	Y	Y	Y	Y	N	Y
iLO	Y	Y	Y	Y	N	Y
IPMI 1.5	Y	N	Y	Y	Y	N
IPMI 2.0	Y	Y	Y	Y	Y	N
RSA II	Y	Y	Y	Y	Y	Y

NOTE: When a target device does not have an SP, Target Device Console, native IP and DirectCommand are the only management options available by default. The target device types may be customized to make other management features available.

SP console management option

Table 1.2 shows the SP console management option names and command names used either when you are logged into the Web Manager, when you have selected a target devices from the spshell menu on the MergePoint 5224/5240 SP manager console or when you are entering the ssh command on a remote workstation. All options give access to the SP console and are only available for managed servers with SPs.

Table 1.2: SP Console Power Management Options

Method	Option or Command Name
Web Manager	SP Console

Table 1.2: SP Console Power Management Options (Continued)

Method	Option or Command Name
spshell menu in the MergePoint 5224/5240 SP manager console	Access the service processor's console
ssh command	spconsole

Device console (SoL) management option

Table 1.3 shows the device console management (SoL) option names and command names used when you are logged into the Web Manager, when you have selected a target device from the spshell menu on the MergePoint 5224/5240 SP manager console and when you are entering the ssh command on a remote workstation.

Table 1.3: Device Console (SoL) Management Options

Method	Option or Command Name
Web Manager	SoL Console
spshell menu in the MergePoint 5224/5240 SP manager console	Access the device's console via SoL
ssh command	devconsole

Event log (SEL) management option

Events are messages logged when system management events are detected. The events can be logged either by the SP or by the server. Table 1.3 shows the event log management option names and command names used when you are logged into the Web Manager, when you have selected a target device from the spshell menu on the MergePoint 5224/5240 SP manager console and when you are entering the ssh command on a remote workstation. These options display the system event log (SEL) menu from the server where the SP resides. The user can view or clear event logs directly on the SP using the ssh command. All options are only available for managed servers with SPs.

Table 1.4: Event Log (SEL) Management Options

Method	Option or Command Name	Action
Web Manager	Event Log	Brings up a screen with the event log management options • View event log • Clear event log

Table 1.4: Event Log (SEL) Management Options (Continued)

Method	Option or Command Name	Action
spshell menu in the MergePoint 5224/ 5240 SP manager console	Manage the event log	Brings up a menu with the event log management options • View event log • Clear event log
ssh command	sel clearsel	• Displays the event log • Clears the event log

Access to native features on a target device

Both Native IP and DirectCommand management options provide native access to target devices and enable an authorized user to connect directly either to the web management interface of a target device or to the command line of a device that redirects console output to a dedicated Ethernet port. When users are configured for target device management actions, the same permission authorizes the user for both Native IP and DirectCommand.

The authorized user obtains authenticated access to a target device's native features such as native applications, integrated web servers and other proprietary interfaces that are available over IP. Native applications are proprietary SP management applications provided by some server vendors, such as HP InSight Manager, IBM Director and Dell Open Manage. Access to a native application usually requires the application to be installed on the user's workstation. Some management applications reside on the SP itself.

Access to native functions on some SPs is through a proprietary web interface on the SP. HP iLO, Dell DRAC and IBM RSA II SPs have a local web server running and provide a web interface that allows administrators remote access for provisioning, monitoring and managing the server. The web interface is accessed through a specific port number. The monitoring and management features supported by some SPs through native web interfaces include access to the server's serial or graphical user interface, power control, access to sensor data and server event logs, SNMP agents and virtual media.

DirectCommand requirements

The DirectCommand option is available only through the Web Manager. DirectCommand creates a Java applet that runs in the background to start a secure SSH tunnel and to connect to the native web interface on the target device. Therefore, the Java Runtime Environment must be installed on the user's workstation. The JRE is also a requirement for Web Manager access.

The Web Manager allows the administrator to configure up to 20 ports and associate them with other services that may also be invoked by DirectCommand. As described in the troubleshooting appendix in the installer and administrator guide, the administrator must take care to ensure that local applications are not using the same TCP ports that are used by DirectConnect.

Native IP requirements

Native IP access requires a pre-existing secure tunnel between the user's workstation and the MergePoint 5224/5240 SP manager. Table 1.5 shows the native IP parameters and command names available when you are logged into the Web Manager, when you have selected a target device from the spshell menu on the MergePoint 5224/5240 SP manager console and when you are entering the ssh command on a remote workstation.

Table 1.5: Native IP Management Options

Method	Parameter or Command Name
Web Manager	Native IP
spshell menu in the MergePoint 5224/5240 SP manager console	• Enable native IP • Disable native IP
ssh command	• nativeipon • nativeipoff

After an authenticated and authorized user establishes a secure tunnel and selects the *Native IP* option, the user can bring up a native web interface or launch a native web management application from where it resides on the user's workstation or from the SP's console.

Native IP access depends on the following being true:

- The SP must provide the desired native management functionality. For example, SPs using IPMI protocols do not provide native web access.
- The user is authorized to access the Native IP option on an SP.
- The user has created a secure tunnel to the MergePoint 5224/5240 SP manager. An SSH tunnel gives access to native web applications only while a VPN tunnel gives access to both native web and native management applications.

Tasks for creating secure tunnels and obtaining native IP access

See Chapter 2 for creating information on creating secure tunnels and obtaining Native IP access.

Power management options

Table 1.6 shows the power management option names and command names used when you are logged into the Web Manager, when you have selected a target device from the spshell menu on the MergePoint 5224/5240 SP manager console and when you are entering the ssh command on a remote workstation. The power management options are only available for managed servers with SPs.

Table 1.6: Power Management Options

Method	Option or Command Name	Action
Web Manager	• Power On • Power Off • Power Cycle • Power Status	• Turn power on • Turn power off • Power cycle • Check power status
spshell menu in the MergePoint 5224/5240 SP manager console	Manage power	Brings up a menu of power management options • Turn power on • Turn power off • Turn power off then on • Get power status
ssh command	power	Power management options are performed using the following power management commands • poweron • poweroff • powercycle • powerstatus

The effects of the SP power management commands differ from one vendor's SP to another. Table 1.8 describes the options. If an SP provides more than one of the options shown, the hard power option is performed.

Table 1.7: Possible Power Management Command Effects

Power Command	Option
Power off	• Hard power off: remove the power • Soft power off: shut down the operating system before removing the power
Power cycle (turn power off, then on again, to reboot the server)	• Hard power cycle: remove the power, wait several seconds and then turn the power on again (to reboot the server) • Soft power cycle: shut down the operating system, wait several seconds and then turn power on again

See *Power Management Options* on page 19 for an overview of all the types of power management that users can perform.

Reset commands

Table 1.8 shows the reset options available when you are logged into the Web Manager, when you have selected a target device from the spshell menu on the MergePoint 5224/5240 SP manager console and when you are entering the ssh command on a remote workstation. The reset management options are only available for managed servers with SPs.

Table 1.8: Reset Options

Method	Command or Option
Web Manager	Reset
spshell menu in the MergePoint 5224/5240 SP manager console	reset
ssh command	reset

The effects of the reset command differ from one vendor's SP to another and sometimes between firmware versions from the same vendor. In addition, some SPs have more than one type of reset, as described in the following list:

- Warm reset (or warm boot): only the server's operating system is restarted
- Cold boot: the server is fully restarted (the same effect as issuing a Power cycle command)

If an SP has more than one type of reset option, the MergePoint 5224/5240 SP manager Reset command performs the highest level of reset: the cold boot option if available.

If the administrator is configuring an SP that provides multiple reset options, the administrator can customize an associated SP management script to cause the reset command to perform one of the lower levels of reset available on the SP. Customizing SP management scripts is described in the MergePoint 5224/5240 Service Processor Manager Installer and Administrator Guide.

Sensor management options

An authorized user or administrative user can view graphical displays of sensor data collected from servers by their SPs. These users can also modify graph display settings through the Web Manager or the user shell menu or by using the ssh command with the sensor commands.

Figure 1.2 shows an example graph. The sensor value in a graph's heading varies with the type of data being measured and the type of SP. The example fan sensor reading in Figure 1.2 has a heading Time Vs. % because the sensor is measuring the percentage of total possible fan speed. Examples of other possible values for sensor_value are Volts, Degrees Centigrade and Degrees Fahrenheit.

For procedures for monitoring sensors, see *To view a server's sensor data from an SP (Web Manager):* on page 43.

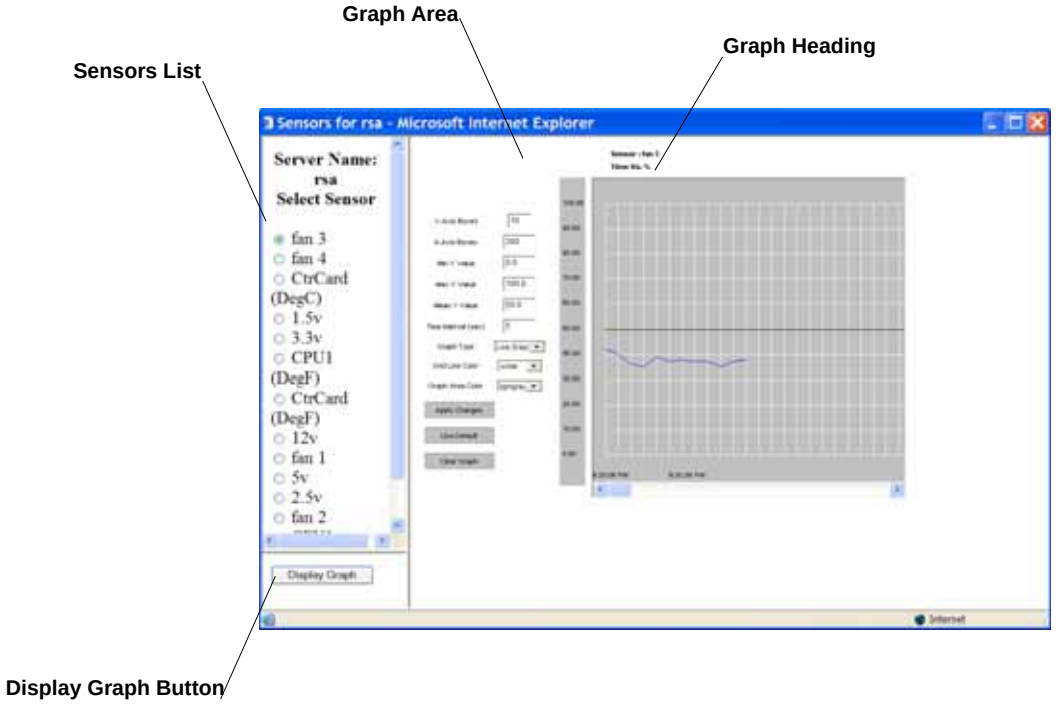


Figure 1.2: Example Graph for Readings From a Fan Sensor

Table 1.9 shows graph features that can be modified. An error message appears if you enter a value that is greater than or lower than the supported range of values.

Table 1.9: Sensor Graph Parameters

Field/Menu	Use	Default	Allowed Values
y-Axis Boxes	Specify a different number of rows.	10	1-55
x-Axis Boxes	Specify a different number of columns. Each graph cell represents the interval between readings.	300	1-999
Min Y Value	Specify a different minimum sensor value to be plotted on the x axis. The only valid keys are numeric keys, period (.) and hyphen (-).	Varies with the type of sensor	Varies with the type of sensor
Max Y Value	Specify a different maximum sensor value to be plotted on the y axis. The only valid keys are numeric keys, period (.) and hyphen (-).	Varies with the type of sensor	Varies with the type of sensor

Table 1.9: Sensor Graph Parameters (Continued)

Field/Menu	Use	Default	Allowed Values
Mean Y Value	Specify a different mean value to use as a basis for comparison with the actual detected value. The only valid keys are numeric keys, period (.) and hyphen (-). In line graphs, the Mean Temp is indicated by a black horizontal line. In bar graphs, the colors of the bars indicate the following: • Blue – Less than the mean Y value. • Red – Greater than mean Y value. • Black – Equal to the mean Y value.	Varies with the type of sensor	Varies with the type of sensor
Time Interval	Specify a different frequency in seconds for fetching sensor data. The only valid keys are numeric keys.	5	5-300
Graph Type	Choose another graph type.	Line Graph	Line Graph or Bar Graph
Grid Line Color	Choose another color for the lines.	• white	• yellow • green • cyan • gray • darkgray • lightgray • magenta • orange • pink • white
Graph BG Color	Select the background color.	• light gray	• yellow • green • cyan • gray • darkgray • lightgray • magenta • orange • pink • white

Table 1.10 shows the sensor management options available when you are logged into the Web Manager, when you have selected a target device from the spshell menu on the MergePoint 5224/5240 SP manager console and when you are entering the ssh command on a remote workstation. The sensor options display unformatted sensor data collected from the server by its SP. The page that appears provides a button that when clicked displays graphs of data from individual sensors.

The sensor management options are only available for managed servers with SPs.

Table 1.10: Sensor Management Options

Method	Command or Option
Web Manager	Sensors
spshell menu in the MergePoint 5224/5240 SP manager console	sensors
ssh command	sensors

Authentication

Anyone accessing the MergePoint 5224/5240 SP manager must log in by entering a username and password. Controlling access by requiring users to enter names and passwords is called authentication. The usernames and passwords entered during login attempts are checked against a database. Access is denied if the username or password is not valid.

The password database being checked can reside either locally (on the MergePoint 5224/5240 SP manager) or on an authentication server on the network.

The user is required to enter a username and password in the following cases:

- When logging into the MergePoint 5224/5240 SP manager.

  The authentication method chosen for the MergePoint 5224/5240 SP manager is used for all access through Telnet, SSH or the Web Manager. By default, logins to the MergePoint 5224/5240 SP manager use local authentication.

- When accessing an SP or other target device.

Users may be required to enter different usernames and passwords when accessing the MergePoint 5224/5240 SP manager than when accessing a target device.

Security Profiles' Effects on Users' Actions

When the MergePoint 5224/5240 SP manager is being managed without DSView 3 management software, the administrator needs to select a security profile based on the security requirements of the organization.

NOTE: All of the features and procedures described in this guide work when the Moderate security profile is in effect.

Table 1.11: Services and Other Functions Controlled by Security Profiles

Service	Other Functions That May Be Allowed/Disallowed
FTP	N/A
HTTP, HTTPS	Redirect HTTP automatically to HTTPS
ICMP	N/A
IPSec	N/A
PPTP	N/A
RPC	N/A
SNMP v1, v2c, v3	N/A
SSH v1, SSH v2	Allow root login using SSH Assign an alternate port to SSH
Telnet	Allow Telnet to MergePoint 5224/5240 SP manager

Services may also be turned on and off independently from the security profile. For more details, see the MergePoint 5224/5240 Service Processor Manager Installer and Administrator Guide.

In addition to turning services on and off, an administrator may select the security profile option to override authorizations, which enables access based on authentication only.

NOTE: If you are prevented from using a service you need to use, such as FTP or SNMP, talk with the administrator to find out if the service can be enabled or if another way of performing a necessary task is available that is consistent with your site's security policies.

When a user connects to any console using the Web Manager, a window running a MindTerm applet appears with an encrypted SSH connection between the user's workstation and the console. MindTerm is an SSH client that includes an integrated xterm/vt100 terminal emulator and runs as a Java applet within a browser window.

To use MindTerm, the user's browser must have a Java plug-in enabled, as described in *Requirements for Java Plug-In Availability* on page 36.

See *MindTerm Applet Reference* on page 59 for details about use and configuration and about hotkeys that can be used during console sessions through the Web Manager.

Accessing the MergePoint 5224/5240 SP Manager Console

Administrators and authorized users can access the MergePoint 5224/5240 SP manager console, in the following ways:

- Through the DSView 3 management software, if it is being used to manage the SP manager.
- By local logins through the console port: Local administrators or authorized users can access the command line by logging in through the console port. This requires the user or administrator to have physical access to a terminal or workstation that is connected to the MergePoint 5224/5240 SP manager's console port. The user or administrator logs in through a terminal or through a terminal emulation program running on a connected workstation.
- By using SSH: Remote administrators and authorized users can access the MergePoint 5224/5240 SP manager's command line through an SSH connection between the user's workstation and the MergePoint 5224/5240 SP manager. See *Using SSH Management Commands* on page 17.
- By clicking *Appliance - Connect* on the Web Manager: After logging into the Web Manager, any type of user can access the console by clicking *Appliance* in the left menu and then clicking the *Connect* button.

  The following sections describe the menus available to regular users and administrative users after they log into the MergePoint 5224/5240 SP manager console.

User Shell (rmenush)

The default login shell for non-administrative users is /usr/bin/rmenush. After logging in as described in *Accessing the MergePoint 5224/5240 SP Manager's Console* on page 21, regular users see the menu options described in the following table. See *Accessing Management Features From the User Shell Menu* on page 22 for more details.

Table 1.12: User Shell Default Menu Options

Menu Option	Function
Access devices	Executes spshell to display a list of devices the user can access. See *SP Shell (spshell)* on page 17.

Table 1.12: User Shell Default Menu Options (Continued)

Menu Option	Function
Change password	Allows the user to set a new password.
Logout	Logs the user out of the MergePoint 5224/5240 SP manager's console.

NOTE: An administrator may modify the menu options and commands shown in Table 1.12 so that you may be presented with a different menu of choices.

SP Shell (spshell)

When you select *Access devices* from the login menu shown in Table 1.12, the MergePoint 5224/5240 SP manager shell, /usr/bin/spshell, displays a list of target devices you are authorized to access, as shown in the following example.

```
Select a device
-rack1_dev2_compaq_proliant_ilo
 rack1_dev1_ibm_e306_rsa
 au_rack1_dev1_ilo
 Exit
```

An administrative user can access a similar list of all target devices by entering **/usr/bin/spshell** on the command line. A submenu lists the management actions available to the user. See *Accessing Management Features From the User Shell Menu* on page 22 for more details.

Using SSH Management Commands

Both SSH v1 and SSH v2 services are supported on the MergePoint 5224/5240 SP manager. The administrator may disable either version; if only one version of SSH is enabled, authorized users can use only a client running the same version.

If SSH is enabled, authorized users can use ssh in the following ways:

- For accessing the MergePoint 5224/5240 SP manager console using an SSH client or the ssh command, then connecting through the MergePoint 5224/5240 SP manager to perform management actions. See *Accessing the MergePoint 5224/5240 SP Manager's Console* on page 21.
- Using the ssh command with special management commands to perform management actions without having to log into the MergePoint 5224/5240 SP manager first. See *Management commands for use with the ssh command* on page 18. See *Accessing Management Features From the User Shell Menu* on page 22 and *Accessing the Console of a Target Device* on page 24.

ssh command line format

The general format of the ssh command line is shown in the following example.

```
% ssh -t username:[devicename]@SPmanager_IPaddress_or_DNS_name [command]
```

where:

The -t option is required to launch an interactive session.

The username is the account name of the authorized user.

The devicename is the name/alias that was assigned to the target device by the MergePoint 5224/5240 SP manager administrator (used only when accessing a target device).

NOTE: To access the MergePoint 5224/5240 SP manager console, omit the target device name.

The SPmanager_IP_or_DNS_name is the IP address of the MergePoint 5224/5240 SP manager or its DNS name.

The command is one of the MergePoint 5224/5240 SP manager-specific management commands described in *Management commands for use with the ssh command* on page 18.

For details, see *Access to native features on a target device* on page 7.

Management commands for use with the ssh command

Users can perform management actions directly on a target device by using the ssh command along with one of the following MergePoint 5224/5240 SP manager-specific management commands:

- spconsole
- devconsole
- poweron, poweroff, powercycle, powerstatus
- reset
- sensors
- sel, clearsel
- native_ip_on, native_ip_off

DirectCommand is not available when using ssh. For details about the management actions performed by the commands, see *Using SSH Management Commands* on page 17.

The following example command line allows an authorized user whose username is fred to turn on the power for a server whose alias is configured on the MergePoint 5224/5240 SP manager as drac, when the IP address of the MergePoint 5224/5240 SP manager is 192.168.29.22:

```
% ssh -t fred:drac@192.168.29.22 poweron
```

This next example shows how the root user could invoke the rmenush command when logging into the MergePoint 5224/5240 SP manager to bring up the user login shell menu:

```
% ssh -t root:@192.168.44.111 rmenush
```

Dial-in Access

Authorized users can dial into the MergePoint 5224/5240 SP manager through either of the following types of optional modems and phone cards:

- An external modem connected to the AUX port
- A modem, GSM or CDMA PCMCIA card inserted into one of the front PC slots

The MergePoint 5224/5240 SP manager can be accessed using PPP when the following prerequisites are completed:

- The modem or phone card has been configured on the MergePoint 5224/5240 SP manager for PPP or Autodetect and for optional callback
- The PPP application at the remote caller's end has been configured for dialing into the MergePoint 5224/5240 SP manager and optionally for callback from the MergePoint 5224/5240 SP manager
- The user account has been configured for PPP access and the user knows the PPP username and password configured by the MergePoint 5224/5240 SP manager administrator

The MergePoint 5224/5240 SP manager can be accessed from a terminal emulation program on the user's workstation if the modem or phone card is configured for Login or autodetect. The one-time password authentication method can be configured for login access to PC modem or phone cards.

Power Management Options

The MergePoint 5224/5240 SP manager provides the following two types of power management options for administrators and authorized users:

- IPDU power management

  Allows the user to manage power for any type of AC device that may be plugged into a Cyclades PM IPDU, when the IPDU is connected to the MergePoint 5224/5240 SP manager AUX port.

  For details about the Web Manager-IPDU screen that is used to manage power outlets and for links to procedures, see *Managing Power Outlets on a Connected IPDU* on page 52.

- SP power management

  Allows the user to manage power for a server whose SP is connected to the MergePoint 5224/5240 SP manager when the SP provides power management capabilities. See *Power management options* on page 9 for details about power management of connected servers that have SPs.

Information Users Need

Users need to obtain the following information from the MergePoint 5224/5240 SP manager administrator:

- The user's name and password.
- The names of target devices that the user is authorized to manage and the management actions that the user may perform.
- Information about services that are enabled or disabled on the MergePoint 5224/5240 SP manager. For example, the administrator may have configured the MergePoint 5224/5240 SP manager so that HTTP or SSH v1 are disabled.
- A list of any IPDU power outlets the user is authorized to manage.
- For native IP users using PPTP VPN connections, the PPTP password, which may be different from the password used to access the MergePoint 5224/5240 SP manager.
- For native IP users using IPSec VPN connections, authentication information for either shared secret or RSA key authentication.

CHAPTER 2

Accessing the MergePoint 5224/5240 Appliance and Target Devices

The following topics describe how to access the MergePoint 5224/5240 SP manager and target devices:

NOTE: Chapter 3 describes using the Web Manager to manage target devices. This chapter contains procedures that must be performed on the command line.

Accessing the MergePoint 5224/5240 SP Manager's Console

As described under *User Shell (rmenush)* on page 16 and *SP Shell (spshell)* on page 17, authorized users who connect to the MergePoint 5224/5240 SP manager's console are presented with a menu of choices. From the initial menu, users can bring up a list of target devices that they are authorized to access and then access a submenu of management actions they can perform on the selected target device.

This section describes how to access the MergePoint 5224/5240 SP manager's console using SSH. The following procedure requires the listed prerequisites to be met:

- The user must know the IP address of the MergePoint 5224/5240 SP manager.
- The user must have a username and password for the MergePoint 5224/5240 SP manager.
- The user's workstation must be running an SSH client and either has an SSH application such as PuTTY or access to the command line.
- If using the ssh command, the user must know the correct format, which is described in *ssh command line format* on page 18.

To access the MergePoint 5224/5240 SP manager console:

1. If you are using a terminal or terminal emulation program installed on a workstation that is physically connected to the console port of the MergePoint 5224/5240 SP manager, start the terminal session with the following factory-default console port settings.

   Serial Speed: 9600 bps

   Parity: None

   Flow Control: None

   Data Length: 8 bits

   Stop Bits: 1

   ANSI emulation

2. In an SSH application or in an ssh command line, enter the username and the MergePoint 5224/5240 SP manager IP address or DNS name.

   The following example shows entering an ssh command with francisco as the username and 192.168.44.111 as the IP address.

   ```
   % ssh francisco@192.168.44.111
   ```

3. Log in when prompted.

   After authentication and login, a shell prompt appears for administrative users (root, admin or other users who are members of the admin group). For authorized non-administrative users, the user shell menu appears.

Accessing Management Features From the User Shell Menu

After logging in as described in *Accessing the MergePoint 5224/5240 SP Manager's Console* on page 21, non-administrative users see a menu like the one shown in the following example.

```
-Access Devices
 Change Password
 Logout
```

Administrative users can get to the same menu either by entering the rmenush command on the ssh command line or by entering /usr/bin/rmenush on the command line after login. You can move from one item to another on the menu and submenus by using the keyboard arrow keys. A line (-) appears next to the selected item.

As described in *User Shell Default Menu Options* on page 16, if a regular user selects Access Devices, a menu appears with a list of target devices that the user is authorized to access, as shown in Figure 2.1.

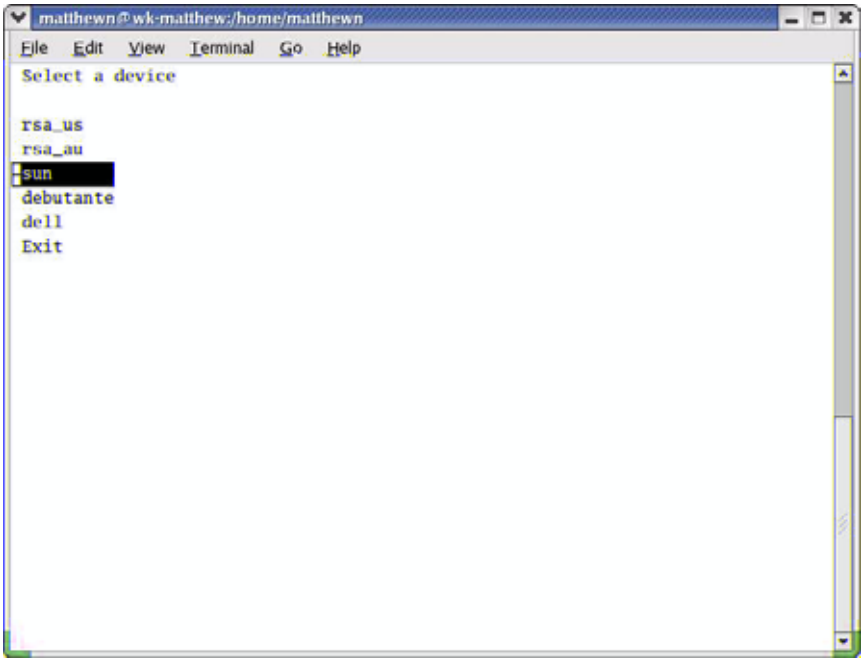


Figure 2.1: Device Access Menu

After a target device is selected, pressing the **Enter** or **Return** key brings up the list of actions the user is authorized to perform on the target device.

Not all listed actions are supported for all SPs. The following example shows the SP action menu for an rsa-type SP.

```
rsa
 Access the service processor's console
 Access the device's console via SoL
 Manage power
 Reset
 Manage the event log
 Enable native IP
 Disable native IP
 Exit
 Back
```

Accessing the Console of a Target Device

Chapter 3 tells how to access an SP or device console through the Web Manager. Any type of authorized user can access the console of a connected SP, server or other type of supported device using one of the two additional methods listed below:

- Connecting to the MergePoint 5224/5240 SP manager's console and accessing the SP console or the device console
- Invoking the ssh command along with either the spconsole or devconsole command

See *Management commands for use with the ssh command* on page 18 for the format of the ssh command line when a device management command is used, if desired.

The prerequisites for using the ssh command line to access a device console are shown in the following list:

- The user has access to the ssh command on the command line of the remote workstation
- The user is authorized to access the console of a device or SP
- The user knows the alias of the target device that allows console access
- The user knows know the IP address or DNS name of the MergePoint 5224/5240 SP manager

To use an ssh command to connect directly to a device's or SP's console:

1. To connect directly to a device's console, enter the **ssh** command with the **devconsole** command.

   The following format example shows entering ssh with the -t option, the username francisco, the alias rsa_au, the MergePoint 5224/5240 SP manager IP address 192.168.44.111 and the devconsole command.

   ```
   % ssh -t francisco:rsa_au@192.168.44.111 devconsole
   ```

2. To connect directly to an SP's console, use the **ssh** command with the **spconsole** command.

   The following example shows entering ssh with the -t option, the username francisco, the IP address 192.168.44.111 with the spconsole command.

   ```
   % ssh -t francisco:rsa_au@192.168.44.111 spconsole
   ```

3. When the login prompt appears, log into the console using the username and password configured for the device or SP.

To use the MergePoint 5224/5240 SP manager console menus to access management options:

1. Log into the MergePoint 5224/5240 SP manager console. If you have connected to the MergePoint 5224/5240 SP manager console as a regular user, the user shell menu displays.
2. If you are a regular user, use the arrow keys on your keyboard to navigate to the Access Devices option on the menu and press **Enter** or **Return**.

3. If you have connected to the MergePoint 5224/5240 SP manager console as an administrative or root user, type **/usr/bin/spshell** on the command line.
4. Select the name of the target device to access.
5. Press **Enter** or **Return**. A list of actions displays.
6. Select the desired action from the menu that displays.
7. If you have selected either *Access the service processor's console* or *Access the device's console* when the console login prompt appears, log into the console.

To exit from a console session:

Perform one of the two following steps to exit from the console of an SP, server or device before closing the terminal window:

- On the command line of the terminal, type the **exit** command

  ```
  [root@rdqailo /]# exit
  ```

  -or-

- Enter the hotkey combination **Ctrl**+**e**+**c.**

The terminal window closes.

Creating an SSH Tunnel

As an alternative to using DirectCommand through the Web Manager, an authorized user can access a native web application after creating an SSH tunnel using local port forwarding. An arbitrarily chosen TCP port number on the user's host is forwarded to the IP address of a target device managed by the MergePoint 5224/5240 SP manager.

The prerequisites are shown in the following list:

- The user's workstation must be running an appropriate SSH client.
- The authentication type configured for the target device must be the same as the authentication method configured for the MergePoint 5224/5240 SP manager.
- The user must be authorized for native IP access to the target device.

After the user creates the SSH tunnel and the user is authenticated, the user can launch a browser that runs the native web application on the target device.

PuTTY on Windows and OpenSSH on Linux are some of the SSH clients available for creating an SSH tunnel. The feature works with SSH protocol v1 and v2. See http://www.openssh.com tor additional clients.

Common port numbers are: HTTP 80 and HTTPS 443

Our examples use port 443 for HTTPS for a target device whose IP address is 10.10.1.181.

The example local TCP port number used is 8080. You can select a random number over 1000.

To use OpenSSH on a Linux workstation to create an SSH tunnel:

1. If the workstation is running SSH v2, enter the following command line.

   ```
   $ ssh -l username -f -N -L 8080:10.10.1.181:443
   SPmanager_IPaddress_or_DNS_name
   ```

2. If the workstation is running SSH v1, enter the following command line.

   ```
   $ ssh -1 -l username -L 8080:10.10.1.181:443 \
   SPmanager_IPaddress_or_DNS_name
   ```

3. Enter your username and password when prompted.

To use PuTTY on a Windows PC to create an SSH tunnel to a target device:

1. Open PuTTY.
2. In the Category pane, select *Tunnels* under Connection - SSH.
3. In the main pane, perform the following steps in the Port Forwarding section.
   a. Type the number of the local TCP port to forward in the Source port field. This example uses 8080. You can select a random number over 1000.
   b. In the Destination field, type the IP address of the target device. Follow it with a colon then the port number of the service you want to access through the SSH tunnel.
   c. Click *Add*.
4. In the Category pane, select *Session*.
5. Enter the IP address or DNS-managed name of the MergePoint 5224/5240 SP manager in the Host Name (or IP address) field.
6. Select *SSH* as the protocol.
7. Click *Open*.
8. Enter your username and password when prompted.

To bring up a native web application after an SSH tunnel exists:

1. Bring up a browser.
2. In the location bar enter **http://localhost:portnumber** where portnumber is the TCP port number you specified for forwarding when you created the tunnel.

   ```
   http://localhost:8080
   ```

   In this step, use the local port number you specified for forwarding. In the examples, we used 8080.

3. The native web application appears in the browser.

Creating a VPN Tunnel

The authorized user creates a VPN tunnel using either IPSec or PPTP. A user authorized for native IP can access native IP functionality through the Web Manager or through using ssh management commands after creating a tunnel using either IPSec or PPTP.

Figure 2.2 shows an illustration of a single user's workstation running IPSec on the right end and the MergePoint 5224/5240 SP manager on the left end, with a router and the Internet between the MergePoint 5224/5240 SP manager and the user's workstation.

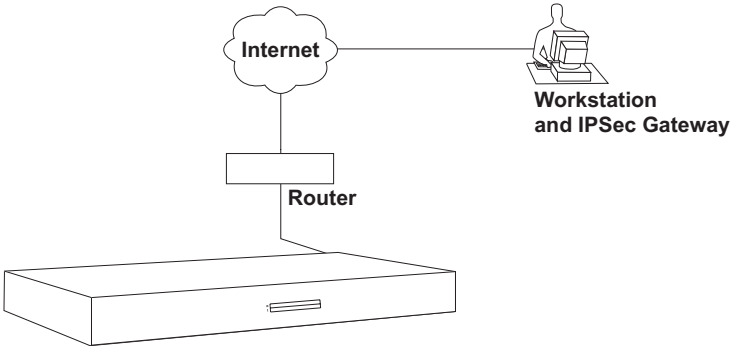


Figure 2.2: MergePoint 5224/5240 Appliance VPN Example Using IPSec

Typically, the user configures a named VPN connection profile (or shortcut) on the user's workstation, using either IPSec or PPTP. The name on the user's end for a preconfigured VPN connection profile might be the name of the MergePoint 5224/5240 SP manager. The name on the MergePoint 5224/5240 SP manager end for a VPN connection profile might simply be the name and location of the user.

NOTE: Most systems, including the MergePoint 5224/5240 SP manager, refer to configuring a VPN connection, but until the connection is actually made, what is informally called a VPN connection is actually a named connection profile or connection shortcut, which stores the information the computer needs in order to establish the connection.

The prerequisites for creating a VPN connection are shown in the following list:

- The user on the remote workstation and the MergePoint 5224/5240 SP manager administrator have configured VPN connection profiles from both sides to support the VPN connection. See *Creating a VPN Tunnel* on page 27 for more details.
- The user has created a VPN tunnel between the user's workstation and the MergePoint 5224/5240 SP manager.
- The user has logged into the MergePoint 5224/5240 SP manager, either through the Web Manager or through the command line and has been authenticated.

An authorized user can enable native IP access in one of the following two ways:

- If the authorized user is connected to the MergePoint 5224/5240 SP manager's console, the user can select the Enable native IP option that appears in the spshell menu for the selected SP.
- If the authorized user is logged into the Web Manager, the user can choose Enable Native IP for the desired target device on the Target devices screen.

The VPN connection must remain active for the duration of the native IP session.

CAUTION: To prevent unauthorized users from accessing the native IP features of the target device, when you are finished, always disable any native IP sessions and then close the VPN connection.

Routing requirements for VPN connections

All routing requirements assume the user's workstation and the MergePoint 5224/5240 SP manager can exchange packets.

IPSec VPN routing requirements

If a route is necessary for the MergePoint 5224/5240 SP manager and the user's workstation to exchange packets, a route can be specified by setting one or both of the Right and Left nexthop parameters to the IP address of a host route and selecting *Add and route* as the boot action. This should be configured by the MergePoint 5224/5240 SP manager's administrator and the configuration should be shared with the user. Once packets can be exchanged between the MergePoint 5224/5240 SP manager and the user's workstation, IPSec automatically creates the routes needed to get packets flowing through an IPSec VPN tunnel, so neither the user nor the administrator need to create routes to support IPSec VPN tunnels to target devices.

PPTP VPN routing requirements

If a network or host route is needed to enable communications between the user's workstation and the MergePoint 5224/5240 SP manager, the user must manually add the route on the user's workstation before creating the PPTP VPN tunnel.

In addition, the user must manually create a static route after the PPTP connection is established to inform the workstation that the target device to be contacted is at the other end of the point-to-point link. The route must include the PPTP address assigned to the MergePoint 5224/5240 SP manager, which the user can discover by running the ifconfig or ipconfig command.

The following example shows the PPTP interface IP address output from the ipconfig command on an Windows NT operating system when PPTP has assigned an IP address of 192.168.2.1.

```
C:\> ipconfig

...

PPP adapter MergePoint5224/5240_PPTP_VPN

...

       IP Address.. . . . . . . . . : 192.168.2.1
```

. . .

If the user needs to communicate with target devices on two separate private subnets, the user must create a route to each private subnet or to each target device.

For example, to communicate with all target devices on a private subnet whose IP address is 192.168.4.0, when the network mask is 255.255.255.0 and the PPTP-assigned IP address for the MergePoint 5224/5240 SP manager is 192.168.2.1, the following route would be needed:

```
route add -net 192.168.4.0 mask 255.255.255.0 via 192.168.2.1
```

If additional target devices must be accessed on additional private subnets, additional routes must be created to each of the subnets.

To communicate with three target devices on a virtual network whose IP address is 172.20.0.0, whose network mask is 255.255.0.0 via the MergePoint 5224/5240 SP manager and PPTP has assigned to the MergePoint 5224/5240 SP manager the IP address 192.168.2.1, the user would need to configure a route like the one shown in the following example:

```
route add -net 172.20.0.0 mask 255.255.0.0 via 192.168.2.1
```

If a virtual network is configured, the user needs to only add a single network route to the virtual network. Check with the MergePoint 5224/5240 SP manager's administrator about which routes you need to configure to connect to the target devices for which you are authorized.

Creating a default route on the user's workstation to the MergePoint 5224/5240 SP manager is not a viable approach. The route would cause the loss of DNS and other local services (such as Internet and mail service) for the user's workstation.

Summary of VPN-related requirements for native IP access

The following list summarizes the requirements for configuring a VPN connection:

- Obtain from the MergePoint 5224/5240 SP manager's administrator the values used in creating the VPN connection profile on the MergePoint 5224/5240 SP manager end and use these values to configure the connection profile on the user's end. Obtain the PPTP password if PPTP is being used. If IPSec is being used, the user may obtain the relevant portion of the MergePoint 5224/5240 SP manager's ipsec.conf file and insert it into the ipsec.conf file on the user's workstation.
- Before attempting to access the native IP feature on the MergePoint 5224/5240 SP manager, the user must start the VPN connection from the user's workstation.

The MergePoint 5224/5240 SP manager listens for the connection attempt from the IP addresses specified in its connection profiles and grants the access.

NOTE: The VPN connection must remain active for the duration of the native IP session.

Creating IPSec VPN connections

For an IPSec VPN connection, the following authentication information is required:

- Username and password
- Connection keys or certificates

The ESP and AH authentication protocols (also called encapsulation methods) are supported. RSA Public Keys and Shared Secret are also supported.

If the RSA public key authentication method is chosen, the generated keys are different on each end. When Shared Secret is used, the secret is shared on both ends.

The MergePoint 5224/5240 SP manager administrator needs to give the user a copy of the configuration parameters used to configure the IPsec connection profiles on the MergePoint 5224/5240 SP manager, usually by providing a copy of the relevant portions of the ipsec.conf file, which the user can insert into the ipsec.conf file on the user's workstation.

To create an IPSec VPN tunnel:

The authorized user must perform the following actions to enable the IPSec client running on the user's workstation to bring up the VPN tunnel that enables access to native IP features on target devices.

1. Make sure your workstation can exchange packets with the MergePoint 5224/5240 SP manager.
   a. Test whether your workstation can access the MergePoint 5224/5240 SP manager by entering the MergePoint 5224/5240 SP manager's public IP address in a browser to try to bring up the Web Manager.
   b. If a network or host route is needed to enable communications with the MergePoint 5224/5240 SP manager, configure the route.
2. Create an IPSec VPN connection profile on your workstation, using the values supplied by the MergePoint 5224/5240 SP manager administrator.

   If the MergePoint 5224/5240 SP manager's administrator sends the relevant portions of the ipsec.conf file from the MergePoint 5224/5240 SP manager's IPSec configuration, use it to replace the same section in your workstation's ipsec.conf file.
3. Bring up the IPSec VPN tunnel.

   Depending on the platform and IPSec client being used, you may use a GUI to create the IPSec VPN connection or execute the ipsec auto -up command.
4. Enable native IP access as described in the following procedure.

To enable native IP access through an IPSec VPN tunnel:

NOTE: The MergePoint 5224/5240 SP manager's administrator must provide the appropriate IP address for this procedure, which is not the same as the public IP address assigned to the MergePoint 5224/5240 SP manager's public interface. The IP address is either the appliance side IP address configured for the private subnet where the target device resides or a virtual IP address configured for the MergePoint 5224/5240 SP manager.

1. Create a VPN tunnel. See *To create an IPSec VPN tunnel:* on page 30 or *To create a PPTP VPN tunnel:* on page 31 if needed.
2. To enable native IP access through a browser, perform the following steps.
   a. Enter the private IP address or virtual IP address assigned to the MergePoint 5224/5240 SP manager in a browser.
   b. Log into the MergePoint 5224/5240 SP manager.
   c. Select *Target devices* in the Web Manager's left menu.
   d. Find the entry for the desired target device and click *Enable Native IP access*.
3. To enable native IP access using the ssh command, perform the following steps.
   a. Enter the **ssh** command with the following syntax: ssh -t username:@privateIP.

      The following command line example uses user AllSPs and a virtual IP address of 172.20.0.1.

      ```
      % ssh -t AllSPs:@172.20.0.1
      ```

   b. Select *Access Devices* from the menu.
   c. Select the target device from the target devices menu.
   d. Select *Enable native IP* from the list of management actions.

Creating PPTP VPN connections

An authorized user can create PPTP VPN connections on Linux, Windows or Macintosh operating systems.

To create a PPTP VPN tunnel:

1. Configure a PPTP VPN connection profile with the following information obtained from the MergePoint 5224/5240 SP manager administrator:
   - The IP address assigned to the MergePoint 5224/5240 SP manager's public interface.
   - The PPTP username and password assigned to the user.
2. Create the PPTP VPN connection.

To enable native IP access through a PPTP VPN tunnel:

1. After creating a PPTP VPN tunnel, enter the ifconfig or ipconfig command on your workstation to discover the PPTP address assigned from the MergePoint 5224/5240 SP manager's IP address pool in the PPTP connection.

2. Set up one of the following types of static routes to enable VPN connections:
   - A network route to the private subnet where the target device resides via the PPTP-assigned address for the MergePoint 5224/5240 SP manager.
   - If a virtual network is configured, a network route to the virtual network where the target device resides via the PPTP-assigned address for the MergePoint 5224/5240 SP manager.
   - A host route to each target device, using the real or virtual IP address assigned to the target device.
3. Enter the PPTP address either in a browser or with ssh on the command line to access the MergePoint 5224/5240 SP manager.
4. Access the target device and enable native IP access.

   See *To access a native web application (Web Manager):* or *To access a native management application that resides on your workstation:* on page 32.

Accessing native features of an SP when a VPN tunnel exists

The following procedures describe how to access native features on an SP after either a PPTP, IPSec or SSH tunnel exists.

To access a native web application (Web Manager):

1. Enter the private or virtual IP address of the MergePoint 5224/5240 SP manager in a browser. The Web Manager appears.
2. Log into the Web Manager.
3. Select *Access - Target devices.*
4. Click the *Enable* link next to Native IP.
5. Click the *Go to native web interface* link that appears.

To access a native web application (from a remote browser):

On your workstation, enter the IP address of the target device in a browser's location field. The native web application appears.

To access a native web application (using the ssh command):

On the command line of your workstation, enter the ssh command with the name/alias of the target device along with the IP address of the MergePoint 5224/5240 SP manager. The native web application appears.

For example, the following ssh command line gives the user named allSPs access to a target device called sp2 using the MergePoint 5224/5240 SP manager's virtual IP address 172.20.0.1.

```
% ssh -t allSPs:sp2@172.20.0.1
```

To access a native management application that resides on your workstation:

Bring up the management application on your workstation.

To access a native management application (from an SP):

If the management application resides on an SP and is an executable that can be invoked on the command line, do one of the following to access the SP's console and launch the management application:

- To use ssh to get to the SP's console to launch the management application, do the following steps.
  a. Enter **ssh** with the **spconsole** command on the command line of your workstation in the following format.

     % **ssh -t allSPs:sp2@172.20.0.1 spconsole**

  b. Bring up the management application from the SP's command line.

  -or-

- To use the Web Manager, perform the following steps:
  a. Log into the Web Manager on the MergePoint 5224/5240 SP manager.
  b. Select *Access - Target Devices*, and find the entry for the target device to access on the screen.
  c. Select the *SPConsole* link.
  d. Log into the SP if prompted.
  e. Bring up the management application from the SP's command line.

Obtaining and Using One Time Passwords for Dial-ins

This section is for users authorized to dial into the MergePoint 5224/5240 SP manager through an external modem, PC modem or phone card when the one time password (OTP) authentication method is configured for logins to that target device. With OTP authentication, you supply a different password every time you dial-in, so no one who discovers the password used for one session can use that password later to access your account. An OTP is a group of six English words that are entered all on the same line at the prompt.

When you dial into the MergePoint 5224/5240 SP manager and enter a username, the system provides a challenge string starting with otp-md5, which tells opiekey to use the MD5 algorithm, followed by a sequence number and a key and waits for a response.The key includes the first two letters of the hostname and a pseudo random number. In the following example, the sequence number is 499 and the seed is on93564.

```
login: username
otp-md5 499 on93564
Response:
```

The user copies the challenge and pastes it into the command line on a non-networked workstation. The opiekey program then prompts the user for the user's secret pass phrase.

Each OTP user needs a local user account on the MergePoint 5224/5240 SP manager, must be registered with the OTP system and must be able to obtain the OTP username, OTP secret pass phrase and OTP passwords needed for logins. The following procedure is for users who have the opiekey program running on a non-networked workstation, who know the secret pass phrase and are able to generate their own passwords.

To generate an OTP when prompted at dial-in:

1. Dial into the MergePoint 5224/5240 SP manager through an external modem, a PC modem or phone card that has been configured to use OTP authentication.
2. Obtain an OTP by performing the following steps.
   a. Copy the challenge into a window on a non-networked workstation where the opiekey program is installed, as shown in the following example.

      ```
      % otp-md5 499 on93564
      ```

   b. Enter your secret pass phrase when prompted. The opiekey program generates a six word OTP.
3. Copy the OTP password to the window where the login program is waiting with the Response prompt.

CHAPTER 3

Web Manager for All Users

The following sections describe how all types of users (authorized and administrative) can use the Web Manager to access the MergePoint 5224/5240 appliance, manage connected SPs and other devices, manage power outlets on any connected IPDUs and manage their own passwords:

Prerequisites for Using the Web Manager

This section describes the required browsers, preparation and browser plug-ins needed for different types of access.The prerequisites described in this section must be complete before anyone can access the Web Manager. If you have questions about any of the following prerequisites, contact your site's system or network administrator:

- The IP address of the MergePoint 5224/5240 appliance must be known. Entering the IP address of the MergePoint 5224/5240 appliance into the address field of one of the supported browsers listed in Table 3.1 is the first step required to access the Web Manager.

  When DHCP is enabled, a target device's IP address may or may not be fixed. When the address is not fixed, anyone wanting to access the MergePoint 5224/5240 appliance must find out the currently assigned IP address each time. If DHCP is enabled and you do not know how to find out the current IP address of the MergePoint 5224/5240 appliance, contact your system administrator for help.

- A user account must be defined on the Web Manager. By default, the admin user has an account on the Web Manager. Any administrator can add regular user accounts to access target devices using the Web Manager.

For accessing the Web Manager, you can use any type of workstation that has access to the network where the MergePoint 5224/5240 Service Processor Manager is installed and any browser (such as Internet Explorer 5.5 or above, Netscape 6.0 or above, Mozilla or Firefox) with a Java 2 plug-in.

Table 3.1: Supported Browser and JRE Versions

Browser	Version	JRE Version
Firefox	1.0.7	JRE 1.5.0_01
Internet Explorer	6.0	JRE 1.5.0_02
Mozilla	1.7	JRE 1.5.0_01
Netscape	7.1	JRE 1.5.0_02

Requirements for Java Plug-In Availability

The Web Manager launches Java applets in the following situations:

- When establishing console access to the MergePoint 5224/5240 appliance and to SPs and other target devices.
- When establishing an SSH tunnel to a target device when a user enables the DirectCommand feature.
- When displaying sensor data.

The Java applets rely on the Java plug-in being installed on the workstation and registered with the browser being used.

Installing the Java 2 Runtime Environment (J2RE) Standard Edition software automatically installs the needed Java plug-in. After you download and install the JRE software, you then must make sure the Java plug-in is registered with the browser. See the http://java.sun.com website for more information.

Logging Into the Web Manager for Regular Users

Both authorized users and MergePoint 5224/5240 appliance administrators can access the Web Manager from a browser using HTTP or HTTPS over the Internet or through a dial-in or callback PPP connection.

After being authenticated during login, authorized users can use the Web Manager to log into target devices, manage power and change their own passwords, but they cannot use the Web Manager for configuring users or target devices. Any number of regular users can connect to the Web Manager at the same time.

MergePoint 5224/5240 appliance administrators can perform additional user and target device configuration tasks through the Web Manager. See the MergePoint 5224/5240 Service Processor Manager Installer and Administrator Guide for details.

Figure 3.1 shows the login screen for the Web Manager that appears when the MergePoint 5224/5240 appliance IP address is entered in a Microsoft Internet Explorer browser.

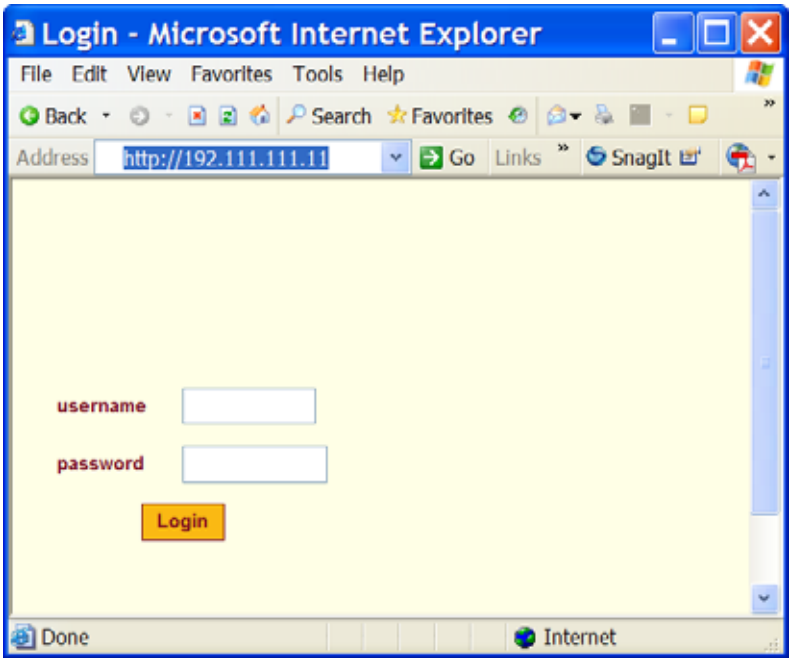


Figure 3.1: Web Manager Login Screen

See *Power Management Options* on page 19 for more about how to use the Web Manager and *Prerequisites for Using the Web Manager* on page 36 for the required browsers, preparation and browser plug-ins needed for different types of access.

To log into the Web Manager:

This procedure assumes you have a valid username and password and that your workstation has a network connection or a PPP connection to the MergePoint 5224/5240 appliance.

1. Enter the IP address of the MergePoint 5224/5240 appliance in a supported browser. See Table 3.1 on page 36 for a list of supported browsers, if needed. The Web Manager login screen appears.
2. Enter your username and password.
3. Click the *Login* button.

Features of Regular Users' Windows

Figure 3.2 shows features of the Web Manager that appear when regular users log in.

Figure 3.2: User Options on the Web Manager

A menu of options appears on the left. The fields, buttons and menus in the screen area in the middle differ according to which option is selected.

MergePoint 5224/5240 appliance administrators see the same list of options shown in Figure 3.2 under the administrator's Access tab. The Access tab is one of multiple tabs that are available on the Web Manager whenever an administrator logs in. Administrators can refer to the MergePoint 5224/5240 Service Processor Manager Installer and Administrator Guide for more details.

Using the Target Devices Screen

The Target devices screen lists device groups and individual target devices that are not in groups for every target device the user is authorized to access. Clicking the plus (+) sign next to the name of a group expands the list of target device entries. Clicking a minus (-) sign hides the list of target device entries.

The entry for each target device has the following:

- Links to the management features the user is allowed to access on that target device
- The name (alias) assigned to the target device
- A real IP address (if a virtual IP address is not assigned to the target device)
- A virtual IP address (if one is assigned to the target device)
- A description of the target device

Figure 3.3: Target Devices Web Manager Screen

Links to management actions are active only when the current user is authorized to use them and when they are supported for associated selected target device.

Accessing a Service Processor's Console

Clicking the *Service Processor Console* link on the Target devices screen gives you access to the command line of the SP. A window running a MindTerm Java applet appears.

To connect to an SP's console (Web Manager):

1. Log into the Web Manager.
2. Select the *SP Console* link from the Action pull-down menu associated with the SP whose console you wish to access. A MindTerm window displays with an SSH connection to the target device.
3. If authentication is enabled for the SP, log in as prompted.

Accessing a Target Device's Console

Clicking the *Device Console* link on the Target devices screen launches a terminal window running a Java applet and creates a console connection with the target device. Figure 3.4 shows an example terminal window with a connection to the console of a Compaq Proliant server with an iLO type SP.

Figure 3.4: Device Console Example

To connect to a device's SoL console (Web Manager):

1. Log into the Web Manager.
2. Select the *Sol Console* link from the Action pull-down menu associated with the target device whose console you wish to access. A MindTerm window displays with an SSH connection to the device.
3. If authentication is enabled for the device, log in as prompted.

Managing Power Through a Service Processor

Clicking the *Power* button on the Target devices screen gives you access to a menu of power management options that are available on the SP.

If an SP supports both a hard power off and a soft power off option, the Turn power off and Power cycle buttons perform the hard power option. If an SP has more than one type of reset option, the Reset command on the Target devices screen performs the highest level of reset, which is the cold boot option (if available). See Table 1.8 on page 10 for more information.

Clicking the *Check power status* button brings up a dialog box that shows the server's power status.

To manage a server's power through its SP (Web Manager):

1. Log into the Web Manager.
2. Select the *Power* link from the Action pull-down menu associated with the target device for which you want to manage power.
3. To power up the server, click the *Power on* link.
4. To power down the server, click the *Power off* link.
5. To reboot the server, click the *Power cycle* link.
6. To check the power status of the server, click the *Power status* link.
7. To reset a server from an SP, click the *Reset* link.

Viewing Sensor Data

Clicking the *Sensors* button on the Target devices screen displays the SP's sensor plotting page. Figure 3.5 shows the Sensors screen that displays unformatted data.

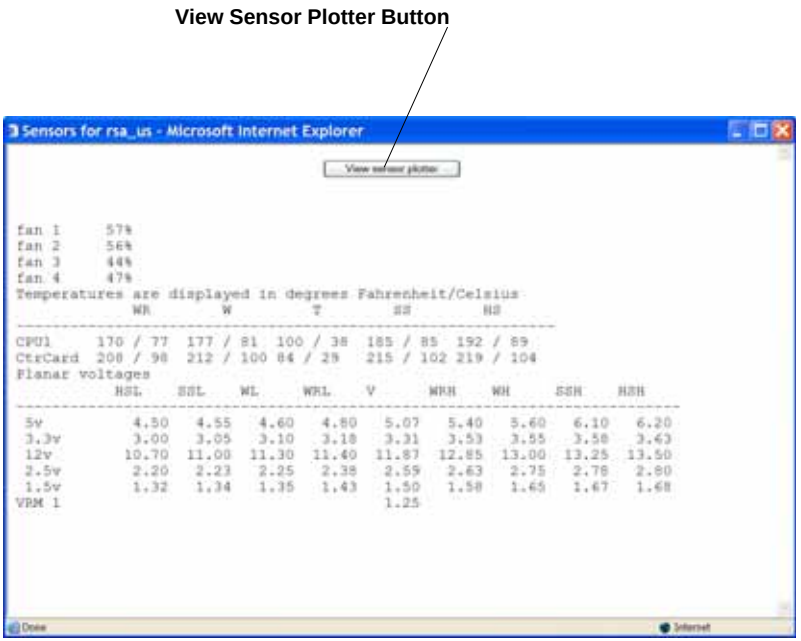


Figure 3.5: Example of Unformatted Sensor Data

Clicking the *View sensor plotter* button in Figure 3.5 brings up a screen allowing you to view data from individual sensors on the server.

The sensor plotter page is shown in Figure 3.6 in the default graph format. Click the radio button next to the desired sensor and click *Display Graph* to display the data from the selected sensor in the graph area.

Users can bring up multiple instances of the sensor plotter page and view different sensors in different graphs at the same time. The graph displays a new reading at a specified interval. The default, which is user-configurable, is five seconds.

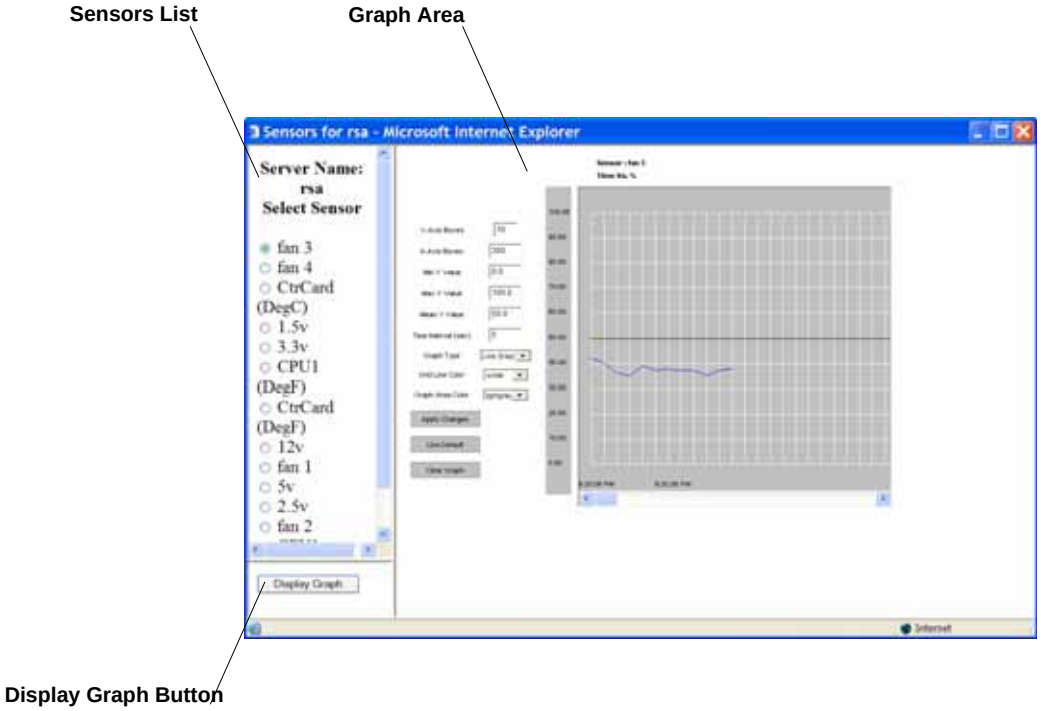


Figure 3.6: Sensor Plotter Page

To view a server's sensor data from an SP (Web Manager):

1. Log into the Web Manager.
2. Click the *Sensors* link associated with the server whose sensors you wish to view. A MindTerm Java applet appears showing unformatted sensor data.
3. Click the *View sensor plotter* button. A list of sensors appears on the left with the main graph area empty.
4. Click the radio button next to the name of the sensor you wish to view.
5. Click the *Display Graph* button. A graph of data from the selected sensor displays in the default graph format.

Viewing and Clearing Event Logs

Clicking the *Event Log* button on the Target devices screen displays the system event log (SEL) menu from the server where the SP resides. Event messages are sent by the SP when system management events are detected. The events may be being logged either by the SP or by the server. The Clear event log button appears at the top of the screen, as shown in Figure 3.7.

Figure 3.7: Example Event Log Web Manager Screen

To view or clear event logs:

1. Click the *Event Log* button on the Target devices screen. The SEL menu from the server where the SP resides appears.
2. View the log, if desired.
3. Click the *Clear event log* button to clear the log, if desired.
4. Close the screen by clicking the X in the upper right.

Accessing Native Features on a Target Device

As mentioned in *Access to native features on a target device* on page 7, the Native IP and DirectCommand privilege authorizes users for both Native IP and DirectCommand actions. If the user is not authorized, the Action pull-down menu for a device on the Web Manager Target devices screen does not list either Native IP or DirectCommand. Some differences between Native IP and DirectCommand options that appear for authorized users are described in the following table with links to sections that provide more details. **(Continued)**

Table 3.2: Differences Between Accessing Native IP and DirectCommand from the Web Manager

Native IP	DirectCommand
The Action pull-down menu for a target device displays Native IP Enable only if a secure tunnel exists between the user's workstation and the MergePoint 5224/5240 SP manager. See *To enable access to Native IP on a target device (Web Manager):* on page 46 for more details. If a secure tunnel does not exist, the Action pull-down menu displays Native IP: Unavailable.	The Action pull-down menu for a target device initially displays DirectCommand Enable.
Clicking the Native IP *Enable* link has the following effects: • Enables Native IP and makes the Disable link active. • Causes the Go to native web interface link to appear. The authorized user can then do one of the following actions: • Click the *Go to native web interface* link to launch a browser that brings up the native web application on the target device. –or– • Launch an SP management application from the user's remote workstation. See *Managing Native IP* on page 46 for more details.	Clicking the DirectCommand *Enable* has the following effects: • Enables DirectConnect and makes the Disable link active. • Launches a Java applet that creates a secure SSH tunnel and manages the DirectConnect connection. • Causes a Go to Direct Command Interface link becomes active on the Action menu. • Causes the DirectCommand Connected link to appear in the upper right of the Web Manager under the IP address. • The SP or device's web interface comes up in a separate window, with a login prompt if login is required. Clicking the DirectCommand *Disable* link closes the window and causes the DirectCommand Connected link to change to DirectCommand: Idle. See *Managing DirectCommand connections* on page 47 for more details.

Managing Native IP

Tasks for creating secure tunnels and obtaining native IP access on page 8 describes tasks for creating the secure tunnel that must exist between the user's workstation and the MergePoint 5224/5240 SP manager before an authorized user can enable Native IP and the Go to native web interface can be active. Figure 3.8 shows an example of a HP iLO web interface as it might appear after an authorized user has the needed tunnel and clicks the *Go to native web interface* link.

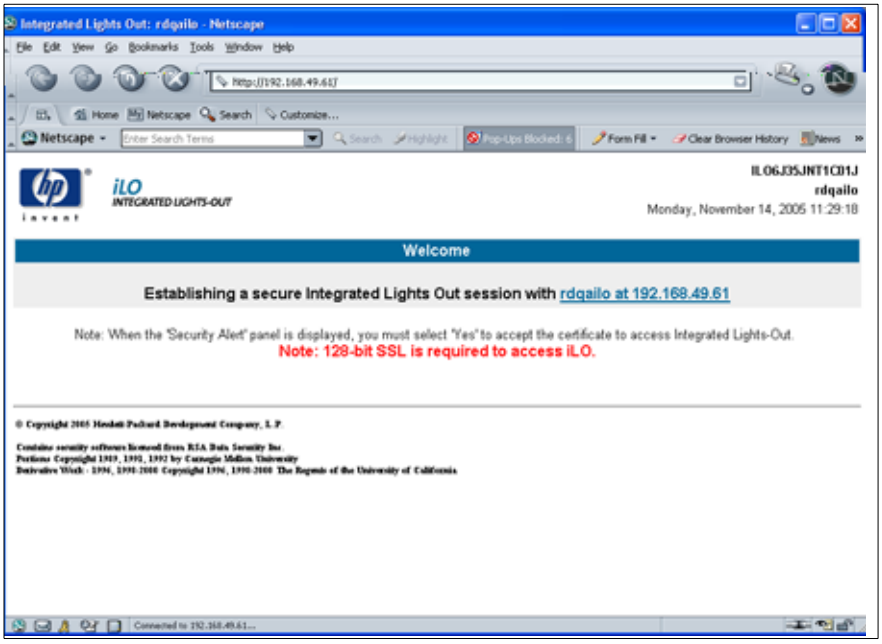


Figure 3.8: Example HP iLO Native Web Interface

CAUTION: When finished with management tasks performed using native IP, the authorized user should always click the *Disable* link. Leaving native IP enabled creates a security risk.

To enable access to Native IP on a target device (Web Manager):

1. Create a secure tunnel between your workstation to the MergePoint 5224/5240 appliance. See *Tasks for creating secure tunnels and obtaining native IP access* on page 8 for overview and *Creating VPN connections for Native IP access* on page 49 for how to create a VPN tunnel.
2. If the VPN connection is made using IPSec, enter the IP address that is assigned to the public interface into a browser to bring up the Web Manager.

3. If the VPN connection is made using PPTP, discover and use the IP address that is assigned on your workstation to the PPTP interface.
   a. If your workstation has a Windows operating system, enter the ipconfig command on the workstation's command line.

      -or-

      If your workstation has a UNIX-based operating system, enter the ifconfig command on the workstation's command line.

   b. In the command output, locate the IP address assigned to the connection.
   c. Enter the PPTP IP address in a browser to bring up the Web Manager.
4. Log into the Web Manager as an authorized user and select the *Target devices* menu option.
5. On the Action pull-down menu for the target device on which you want native IP access, click the Native IP *Enable* link.

   The Go to native web interface link becomes active.

6. Perform one of the following actions, as desired:
   - Click the *Go to native web interface* link to bring up the native web application.

     -or-

   - From your local workstation, launch a previously installed SP management application for the server, if desired.
7. When you are done, always click the *Disable* link as a security precaution.

Managing DirectCommand connections

After a DirectCommand connection is created during a Web Manager session, the Java applet that creates the secure tunnel between the user and the MergePoint 5224/5240 SP manager and that manages DirectCommand connections stays loaded until the Web Manage login session is ended, even if all DirectCommand connections are closed.

The Web Manager provides two ways to manage DirectCommand connections, which are listed below and described in this section:

- Through the Direct Command connection list
- Through the Go to Direct Command Interface link

As mentioned in *Accessing Native Features on a Target Device* on page 45, the first time a user creates a DirectCommand connection by clicking the DirectCommand *Enable* link in the Action pull-down menu, a DirectCommand Connected link appears in the upper right of the Web Manager under the IP Address and a Go to DirectCommand Interface link becomes active in the Action pull-down menu, as shown in Figure 3.9 on page 48.

Figure 3.9: Direct Command: Connected and Go to DirectCommand Interface

DirectCommand connection link

Users can see information about and manage all currently active DirectCommand connections by clicking the *DirectCommand Connected* link, which brings up the dialog shown in Figure 3.10.

Figure 3.10: DirectCommand Connection List

Go to DirectCommand Interface link

After all DirectCommand connections are terminated, the following occur:

- The DirectCommand Connected link changes to Direct Command: Idle.
- The Go to DirectCommand Interface link persists in the Action pull-down menu, and the SSH tunnel between the user and the MergePoint 5224/5240 SP manager remains active. The user can select the *Go to DirectCommand Interface* link to from the Action pull-down menu to create a new DirectCommand connection without having to relaunch the Java applet.

To use DirectCommand to gain native web access to a target device (Web Manager):

1. Log into the Web Manager as an authorized user.
2. The first time during a Web Manager login session, click the DirectCommand *Enable* link in the Action pull-down menu for the target device on which you want DirectCommand access. A Java applet launches a window and connects to the device's native web interface.
3. When you are done, always click the *Disable* link in the target device's pull-down menu as a security precaution.
4. To disconnect from any DirectCommand connections, click *Direct Command: Connected*. The dialog displays listing the currently active DirectCommand connections.
5. Select the desired connection from the list, and then click *Disconnect*.
6. To reconnect later in the same Web Manager login session, click the *Go to DirectCommand Interface* from the target device's Action pull-down menu.

Creating VPN connections for Native IP access

The rules for bringing up the Web Manager for Native IP access through the Target devices screen differ between IPSec and PPTP VPN connections as indicated in the following list:

- If the VPN connection is being made using IPSec, the authorized user may use the MergePoint 5224/5240 appliance's IP address to bring up the Web Manager first and go to the Target device screen before making the VPN connection. After subsequently making the VPN connection, the user can reload the form to see the Enable Native IP link active.
- If the VPN connection is made using PPTP, the VPN connection must be made before the Web Manager can be launched, because the Web Manager must be launched using the PPTP IP address.

  The user obtains the IP address assigned to the PPTP interface by entering the ifconfig or ipconfig command on the workstation's command line (which command to use depends on the operating system). In the command output, the IP address assigned to the connection appears in the lines following the words PPP adapter, as shown in the following.

  ```
  C:\> ipconfig

  ...
  ```

```
PPP adapter MergePoint5224/5240_PPTP_VPN
...
       IP Address. . . . . . . . . . . : 172.0.0.0.100
...
```

The user then enters the PPTP IP address in a browser to bring up the Web Manager and enable native IP access.

See *Tasks for creating secure tunnels and obtaining native IP access* on page 8 for more details.

The following procedures assume the following prerequisites:

- You are running Windows NT on your remote workstation. Use this procedure as an example if configuring a PPTP VPN connection profile on another type of operating system.
- The MergePoint 5224/5240 appliance administrator has done all of the following:
  - Authorized your MergePoint 5224/5240 appliance user account for PPTP access
  - Provided you with the PPTP password if it is different from your MergePoint 5224/5240 appliance password
  - Enabled the PPTP service
  - Configured the MergePoint 5224/5240 appliance for VPN PPTP connections
  - Provided you with an IP address that was assigned while configuring VPN PPTP access on the MergePoint 5224/5240 appliance

To create a PPTP VPN connection profile on Windows:

1. Login in as an administrator on Windows NT.
2. From the start menu, select *My Network Places --view network connections - Create a new connection*. The New Connection Wizard appears.
3. Click the *Next* button.
4. On the next dialog that appears, click the radio button next to Connect to the network at my workplace.
5. Click the *Next* button.
6. On the next dialog that appears, click the radio button next to Virtual Private Network connection.
7. Click the *Next* button.
8. On the next dialog that appears, enter a name for the connection.
9. Click the *Next* button.
10. If the Public Network dialog appears, click the radio button next to Do not dial the initial connection.
11. Enter an IP address for the VPN Server Selection on the next dialog that appears.

NOTE: The IP address is the one assigned to the public interface of the MergePoint 5224/5240 appliance.

12. Click the *Next* button.
13. Click the *Finish* button.

Accessing the MergePoint 5224/5240 SP Manager Console (Web Manager)

Selecting the *Appliance* option on the Web Manager menu, then clicking the *Connect* button brings up a window running a MindTerm Java applet with an SSH connection to the MergePoint 5224/5240 appliance, as shown in Figure 3.11.

Figure 3.11: Appliance Console Login Screen

Regular users by default are not able to access the shell and they cannot do anything on the console that they could not do from the Web Manager menu options. Users are encouraged to use the Web Manager options instead of going through the Web Manager to use the console.

After authentication, the regular user sees the two following choices to access target devices or change the user's password, which are similar to the Web Manager menu options.

Figure 3.12: User Menu When Connected to the Console

For information about what the administrative user can do on the MergePoint 5224/5240 appliance console, see the MergePoint 5224/5240 Service Processor Manager Installer and Administrator Guide.

To access the MergePoint 5224/5240 appliance's console (Web Manager):

1. Log into the Web Manager.
2. Select the *Appliance* option in the left menu.
3. Click *Connect*. A terminal window displays and establishes a console connection to the MergePoint 5224/5240 appliance.
4. Enter the password, if prompted. A menu of options displays for the regular user. For an administrative user a shell prompt appears.

Managing Power Outlets on a Connected IPDU

Clicking the *IPDU* option on the Access menu brings up the message shown in Figure 3.13 if the AUX port has not been configured for IPDU power management. Contact the MergePoint 5224/5240 appliance administrator for help if you see this message.

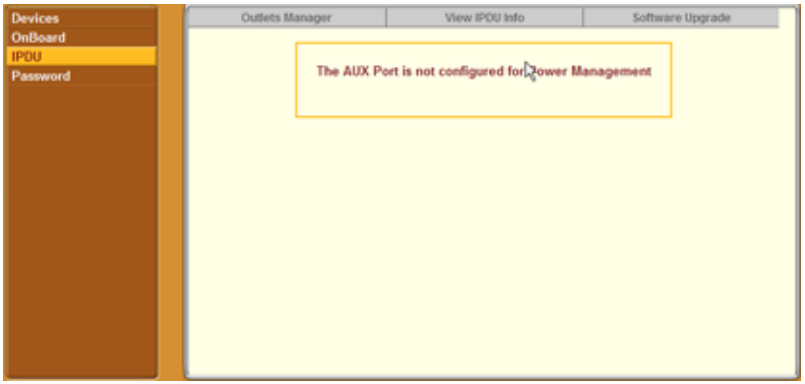


Figure 3.13: AUX Port Not Configured Error Message

Clicking the *IPDU* option on the Access menu when the AUX port has been configured for IPDU power management brings up the Outlets Manager, the View IPDUs Info and the Software Upgrade tabs, as shown in Figure 3.14. For more information, see *Using the Outlets Manager tab to power up and down and check power status* on page 53 and *Viewing IPDU information* on page 56.

NOTE: Only an administrative user can edit the Software Upgrade screen.

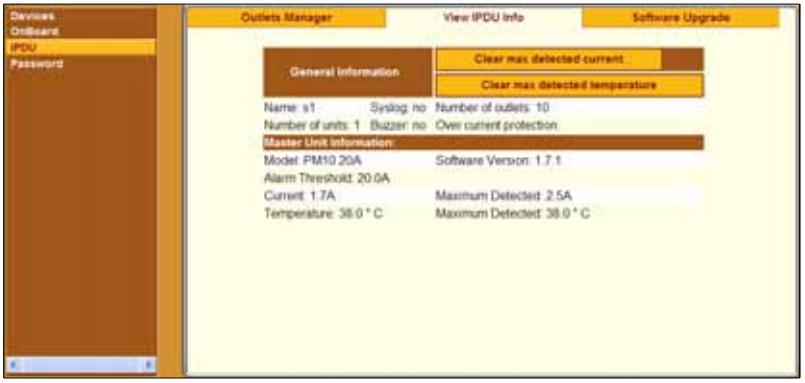


Figure 3.14: IPDU Tabs

Using the Outlets Manager tab to power up and down and check power status

If a regular user clicks the *Outlets Manager* tab under the Access - IPDU menu option, the message shown in Figure 3.15 appears if the user is not authorized to manage power on any outlets or if the MergePoint 5224/5240 appliance cannot detect an IPDU connected to the AUX port. Contact the MergePoint 5224/5240 appliance administrator for help if you receive this message.

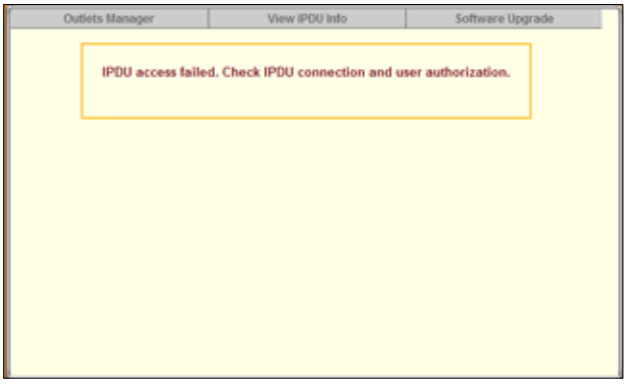


Figure 3.15: IPDU Access Failed Message from Outlets Manager

If a regular user clicks the *Outlets Manager* tab under the Access - IPDU menu option, the screen displays a list of all the outlets the user is authorized to manage. If an administrative user clicks *Outlets Manager* under the Access - IPDU menu option, all the power outlets on all connected IPDUs are listed, as shown in Figure 3.16.

Figure 3.16: Access - IPDU - Outlets Manager Screen

Both regular users authorized for IPDU power management and administrative users can do the following for any of the listed outlets:

- Cycle power
- Lock outlets in the on or off state to prevent accidental changes
- Unlock the outlets
- Turn power off
- Turn power on
- Save any changes made to the outlets state

The name that appears on the screen is either the default s1, which is the port number of the AUX port or an administrator-defined name. A yellow bulb indicates that the outlet's power is on. A gray bulb indicates that the outlet's power is off. An open padlock indicates that the outlet is unlocked. A closed padlock indicates a locked outlet. An orange Cycle button is active next to each outlet that is on; the Cycle button is grayed when the outlet is off. The Save outlets state button allows the user to save any changes made on this screen.

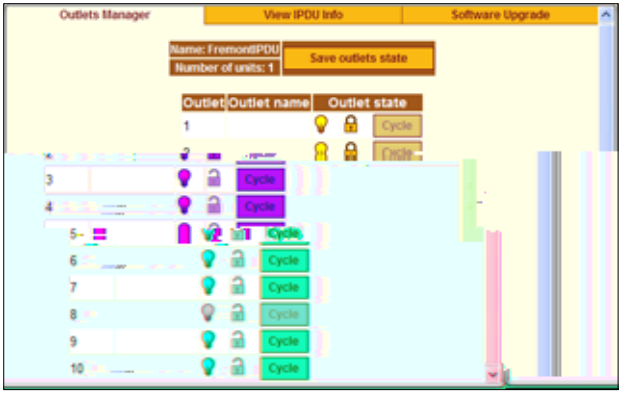


Figure 3.17: Outlets Manager Outlets State Close-up

To manage power outlets on a connected IPDU:

1. Log into the Web Manager.
2. Click the *IPDU* left menu option. The IPDU screen displays with the Outlets Manager screen active.
3. To switch an outlet on or off, click the adjacent light bulb.
4. To lock or unlock an outlet, click the adjacent padlock.
5. To cycle power, click the adjacent *Cycle* button.
6. To save the state of the outlet(s), click *Save Outlets State*.

Viewing IPDU information

When a regular user or administrative user selects *Access - IPDU - View IPDU Info*, the View IPDU Info screen appears.

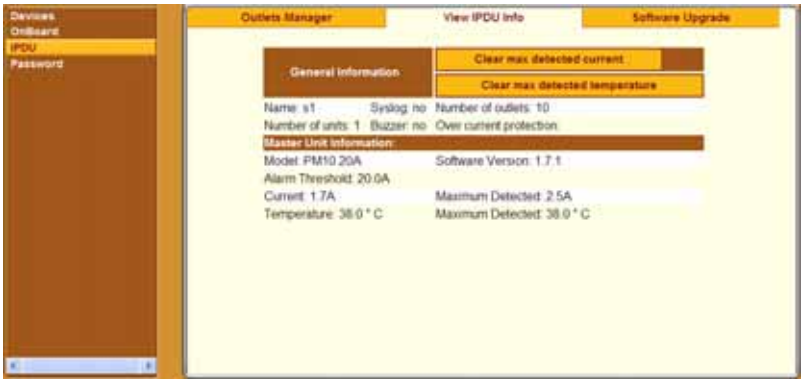


Figure 3.18: View IPDU Info Screen

The following table shows the information displayed on the View IPDU Info screen for each IPDU.

Table 3.3: Information on the View IPDU Info Screen

Field	Description
Name	Administrator-configured name or the default (s1), which is assigned to the AUX port.
Number of units	The number of IPDUs connected to the port. The first IPDU is referred to as the master. Any other IPDUs daisy-chained off the first IPDU are referred to as slaves.
Number of outlets	Total number of outlets on all connected IPDUs.
Buzzer	Whether a buzzer has been configured to sound when a specified alarm threshold is exceeded.
Syslog	Whether syslogging has been configured for messages from this IPDU.
Over current protection	Whether over current protection is enabled (to prevent outlets from being turned on if the current on the IPDU exceeds the specified threshold).

You can view the following information underneath the name of each IPDU (under Unit Information).

Table 3.4: IPDU Information Under Unit Information

Field	Description
Model	IPDU model number

Table 3.4: IPDU Information Under Unit Information (Continued)

Field	Description
Software Version	IPDU firmware version
Alarm Threshold	Number of amperes that triggers an alarm or syslog message if it is reached
Current	Current level on the IPDU
Maximum Detected	Maximum current detected
Temperature	Temperature on the IPDU (only available on selected models that have temperature sensors)
Maximum Detected	Maximum temperature detected

To view IPDUs information:

1. Log into the Web Manager.
2. Click the *IPDU* option in the left menu. The IPDU screen displays.
3. Click the *View IPDU Info* tab.
4. If desired, clear the Maximum Detected value displayed for current by clicking the *Clear max detected current* button.
5. If desired, clear the Maximum Detected value displayed for temperature by clicking the *Clear max detected temperature* button.

Using the Software Upgrade screen to view the IPDU's current software version

An administrative user can upgrade software on a connected IPDU from this screen. Regular users can use this screen only to view the software version.

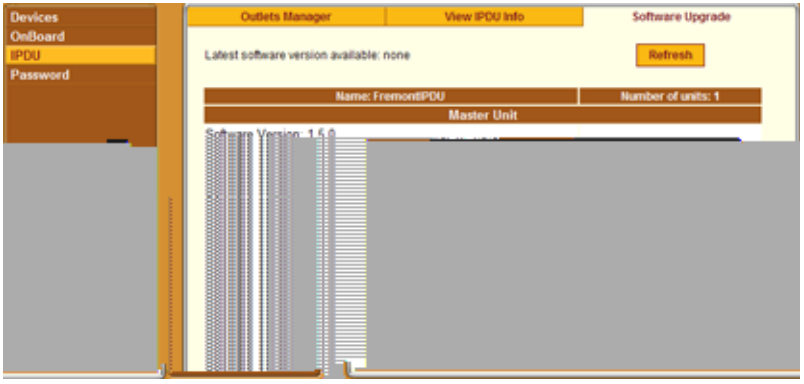


Figure 3.19: IPDU Software Upgrade Screen on the Web Manager

Configuring Your Password

Clicking the *Password* option on the Web Manager left menu brings up the Changing password for user <username> screen, as shown in Figure 3.20.

Figure 3.20: Password Screen

NOTE: Your password cannot exceed 30 characters.

To change your password:

1. Log into the Web Manager.
2. Click the *Password* option in the left menu. The Password screen appears.
3. Enter the new password in the Password field.
4. Enter the password again in the Retype password field.
5. Click the *Set Password* button to save the changes in memory.

APPENDICES

Appendix A: MindTerm Applet Reference

MindTerm is an SSH client that includes an integrated xterm/vt100 terminal emulator and that runs as a Java applet within a browser window. When a user connects to any console using the Web Manager, a window running a MindTerm applet appears with an encrypted SSH connection between the user's workstation and the console.

Java plug-in requirements for MindTerm

To use MindTerm, the user's browser must have a Java plug-in enabled, as described in *Requirements for Java Plug-In Availability* on page 36.

Customizing MindTerm

MindTerm saves session settings in a folder that it creates in the user's home folder on the user's workstation. For example, in a Windows system, the folder is created in C:\Documents and Settings\username\mindterm.

Actions you can perform with the terminal window are listed below:

- Resize the window.
- Edit text with options that include: copy, paste, select all, find and clear screen.
- Change the background and foreground colors.
- Save the contents of the terminal window and buffer to a file.

NOTE: You can make use of this option if you want to print the window's contents, by saving the file and then printing it from another application.

- Re-use saved settings like the scroll buffer size.

Example MindTerm window

Figure A.1 shows an example window that appears when the root user is connected to the console of an SP with an alias of rdqailo. The same terminal window appears whether the connection is being made to the console of an MergePoint 5224/5240 appliance, an SP, a server or another type of device.

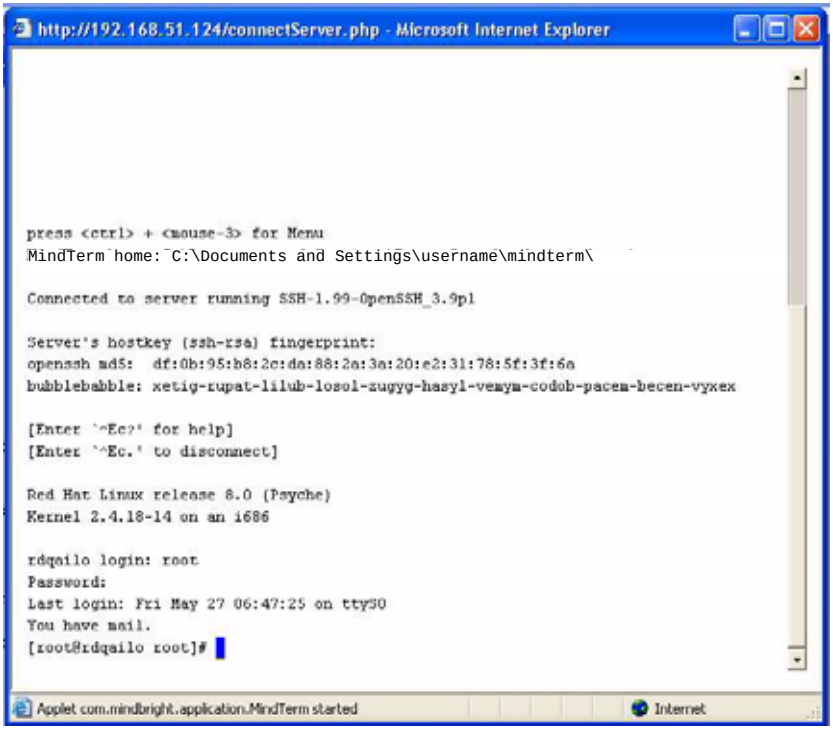


Figure A.1: Root Log into MindTerm Running an SSH Console Session

MindTerm terminal menu options

As is shown in first line of the screen output shown in Figure A.1, you can bring up the terminal menu by pressing **Ctrl** and the right mouse button at the same time: **Ctrl**+mouse right-click. Figure A.2 shows the terminal menu that displays if you enter **Ctrl**+mouse right-click and then drag the cursor to pull down the File menu options.

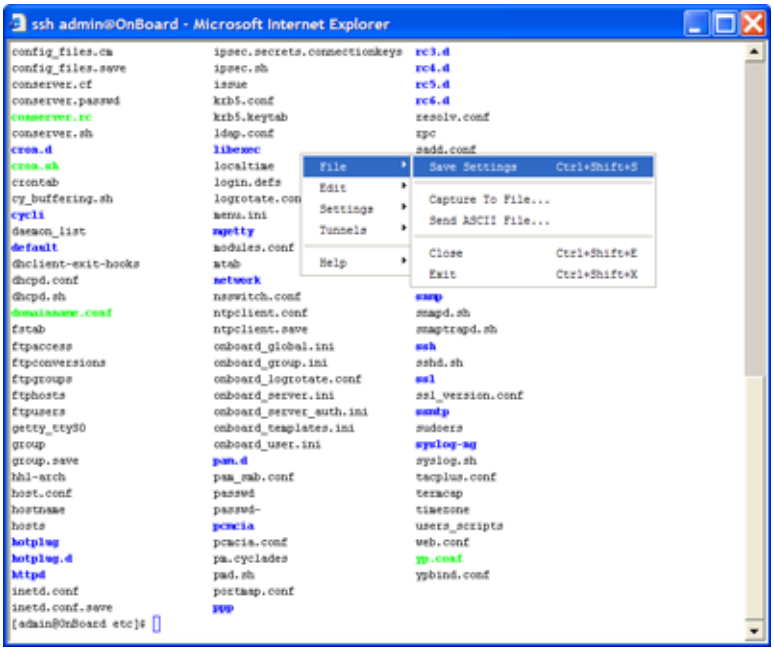


Figure A.2: Terminal Menu

Table A.1: Console Session Terminal Menu Options

1st-level Option	2nd-level Option	Description
File	Save Settings (Ctrl+Shift+s)	Saves current settings to a user-selected file.
	Capture to File (Ctrl+Shift+c)	Starts capturing terminal output to a file, or if this menu option is selected when output is currently being captured, stops capturing.
	Send ASCII File	Sends the contents of a selected file to the terminal as input, as if the contents were being typed on the keyboard.
	Close (Ctrl+Shift+c)	Closes the current window. **NOTE:** If you close a window without logging out, you abort the SSH connection abnormally. The recommended procedure is to log out in the shell before closing or exiting the MindTerm window.

Table A.1: Console Session Terminal Menu Options (Continued)

1st-level Option	2nd-level Option	Description
File (continued)	Exit (Ctrl+Shift+x)	Closes the window without logging out. Closing windows without logging out aborts the SSH connection. Enter the exit command in the terminal before using this option.
Edit	Copy (Ctrl+Insert)	Copies selected text to the clipboard. Select text by clicking and holding down the left mouse button and then dragging the mouse over the area to select, releasing the mouse when the desired area is selected.
	Paste (Shift+Insert)	Pastes the clipboard's contents to the screen as input, as if the contents were being typed on the keyboard.
	Copy & Paste	Copies selected text and pastes it.
	Select All (Ctrl+Shift+a)	Selects all contents in the scrollback buffer and in the terminal.
	Find (Ctrl+Shift+f)	Displays the Find dialog box, which can be used to search the scrollback buffer and the currently displayed text for strings.
	Clear Screen	Clears the screen and positions the cursor at the top left corner.
	Clear Scrollback	Clears the contents of the scrollback buffer.
	VT Reset	Resets terminal settings to the defaults.
Settings	Connection	Displays a dialog box for setting SSH preferences. General: • Server • Username • Authentication Proxy: • Proxy type • Server • Port • Authentication • Username • Password

Table A.1: Console Session Terminal Menu Options (Continued)

1st-level Option	2nd-level Option	Description
Settings (continued)	Connection (continued)	Security • Protocol • Host key type • Cipher • Mac • Compression Features • X11 forward • Local display • Send keep-alive • Interval
	Terminal (Ctrl+Shift+t)	Displays a dialog box for setting terminal characteristics. General: • Terminal type • Columns • Rows • Encoding • Font • Size • Scrollback buffer • Scrollback buffer position Colors • Foreground color • Background color • Cursor color Misc • Paste button • Select delimiter (characters for click-selection)
		VT 1 • Enable Passthrough Print • Copy <cr><nl> line ends • Copy on select • Reverse Video • Auto Wraparound • Reverse Wraparound • Insert mode • Auto Linefeed • Scroll to Bottom On Key Press

Table A.1: Console Session Terminal Menu Options (Continued)

1st-level Option	2nd-level Option	Description
Settings (continued)		VT 2 • Scroll to Bottom On Tty Output • Visible Cursor • Local Echo • Visual Bell • Map <CTRL>+<SPC> to ^@ • Local PgUp/PgDown • Use ASCII for line draw • Backspace sends: del, bs, erase • Delete sends: del, bs, erase
	Auto Save Settings	Enables and disables the automatic saving of settings. When this option is enabled [default], settings are saved automatically whenever you disconnect from a server or exit the terminal. When this option is disabled, you must explicitly save settings to a file in order to preserve them.
Tunnels	Setup	Displays a dialog box listing any previously configured tunnels. Clicking the *Add* button displays a dialog box for configuring a tunnel. Type • Local • Remote Bind address • localhost • all (0.0.0.0) • ip Bind port Dest. address Dest. port Plugin • None • ftp
Help	About MindTerm	Displays a dialog box with information about the Mind Term build date, version, platform you are running.

Using hotkeys during console sessions

MindTerm hotkeys have two components: an escape sequence and a command key. The escape sequence for all the console session hotkeys is **Ctrl**+**e**+**c** (shown as **^Ec**). As shown in Figure A.1,

the applet displays hotkey combinations that you can use to get help (**^Ec?**) or disconnect (**^Ec.**). The following table shows all the available hotkeys, which are entered after the escape sequence.

Table A.2: Hotkeys Available During Console Sessions

Key	Action	Key	Action
.	Disconnect	**a**	Attach read/write
b	Send broadcast message	**c**	Toggle flow control
d	Down a console	**e**	Change escape sequence
f	Force attach read/write	**g**	Group info
i	Information dump	**l?**	Break sequence list
10	Send break per config file	**l1-9**	Send specific break sequence
o	(Re)open the tty and log file	**p**	Replay the last sixty (60) lines
r	Replay the last twenty (20) lines	**s**	Spy read-only
u	Show host status	**v**	Show version info
w	Who is on this console?	**x**	Show console baud info
z	Suspend the connection	**Enter**	Ignore/Abort command
?	Print this message	**^R**	Replay the last line
\too	Send character by octal code		

For example, to send a broadcast message, you would enter **Ctrl**+**e**+**c b** and to tell the applet to abort, you would enter **Ctrl**+**e**+**c Enter** on a Windows keyboard. To exit the session, press **Ctrl**+_.

Appendix B: Technical Support

Our Technical Support staff is ready to assist you with any installation or operating issues you encounter with your Avocent product. If an issue should develop, follow the steps below for the fastest possible service.

To resolve an issue:

1. Check the pertinent section of this manual to see if the issue can be resolved by following the procedures outlined.
2. Check our web site at www.avocent.com/support to search the knowledge base or use the online service request.
3. Call the Avocent Technical Support location nearest you.

INDEX

A

B

C

D

E

F

G

H

I

J

L

M

R

S

T

U

V

W

X

Avocent®

The Power of Being There®

For Technical Support:

www.avocent.com/support

Avocent Corporation
4991 Corporate Drive
Huntsville, Alabama 35805-6201
USA
Tel: +1 256 430 4000
Fax: +1 256 430 4031

Avocent Asia Pacific
Singapore Branch Office
100 Tras Street, #15-01
Amara Corporate Tower
Singapore 079027
Tel: +656 227 3773
Fax: +656 223 9155

Avocent Canada
20 Mural Street, Unit 5
Richmond Hill, Ontario
L4B 1K3 Canada
Tel: +1 877 992 9239
Fax: +1 877 524 2985

Avocent International Ltd.
Avocent House, Shannon Free Zone
Shannon, County Clare, Ireland
Tel: +353 61 715 292
Fax: +353 61 471 871

Avocent Germany
Gottlieb-Daimler-Straße 2-4
D-33803 Steinhagen
Germany
Tel: +49 5204 9134 0
Fax: +49 5204 9134 99

590-675-501A